THE PAPER INDUSTRY
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DETROIT

CHNOLOGY DEPARTMENT

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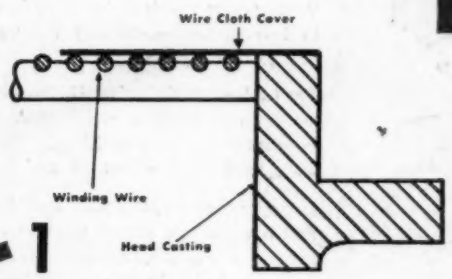
important to the long-range co[illegible] cylinder machine operation and ma[illegible]nance

users of Cheney Bigelow Cylinder [illegible]s are reporting tangible savings [illegible]h the use of these improved CHIME [illegible]S. Each type was designed to meet a [illegible]e need—help insure superior perform- [illegible]nd lower maintenance.

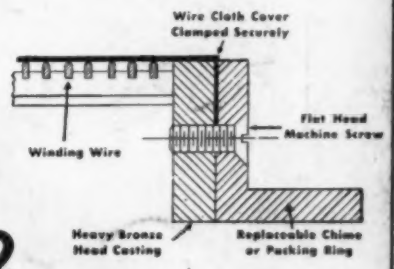
[illegible]ur present moulds, regardless of make, [illegible]e re-built by Cheney Bigelow to incor- [illegible]e one of these types of Chime Rings; [illegible]w type Rubber Seal; and your choice [illegible]ee types of Cylinder Mould Surface [illegible]uction. Write for complete informa- [illegible]n Cheney Bigelow Wire Works, [illegible]field 7, Massachusetts.



1

Type 1. REGULAR

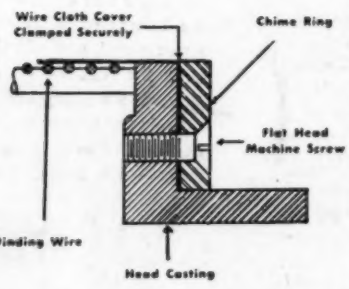
An integral part of the head casting, of special design. Any width or depth can be used.



2

Type 2. REPLACEABLE

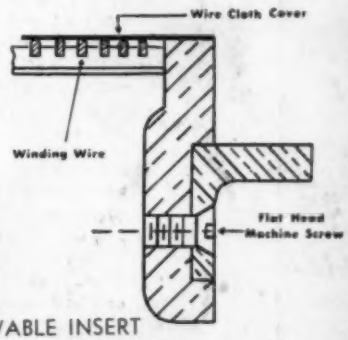
This type is replaceable at considerably less expense than a head casting. The chime, not the head, takes the wear. Doubles as a clamp ring.



3

Type 3. CLAMP RING

In this type the cover is fastened over the head casting, and clamped securely with the clamp ring.



4

Type 4.
REMOVABLE INSERT

A solution to excessive wear. Sets into the head casting and is fastened with flat head machine screws. Ask about the advantages of the stainless steel insert.

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Cheney Bigelow

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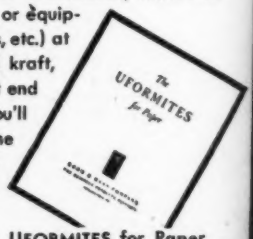

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Your copy of this free booklet will answer your technical questions about the UFORMITES, and how they are used to increase wet strength. Send for it today.

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The Resinous Products Division was formerly The Resinous Products & Chemical Company

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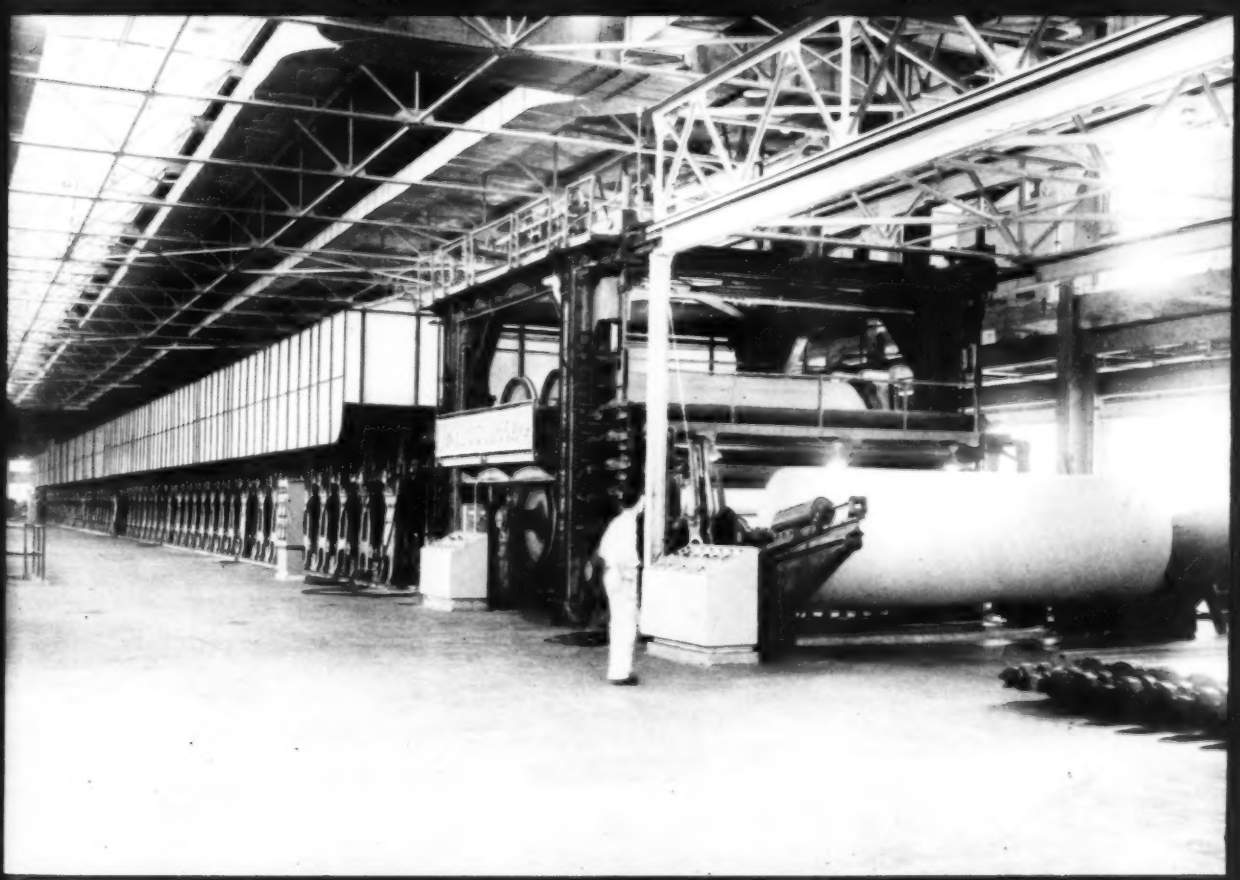

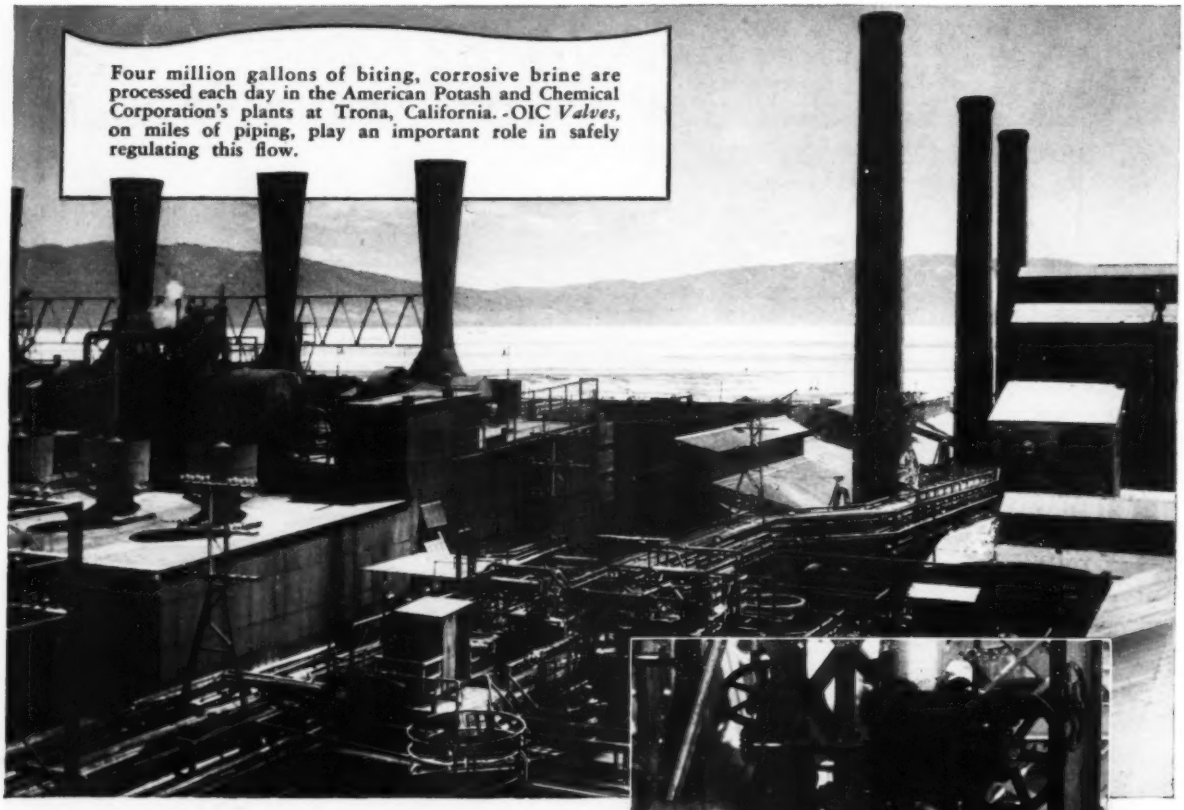

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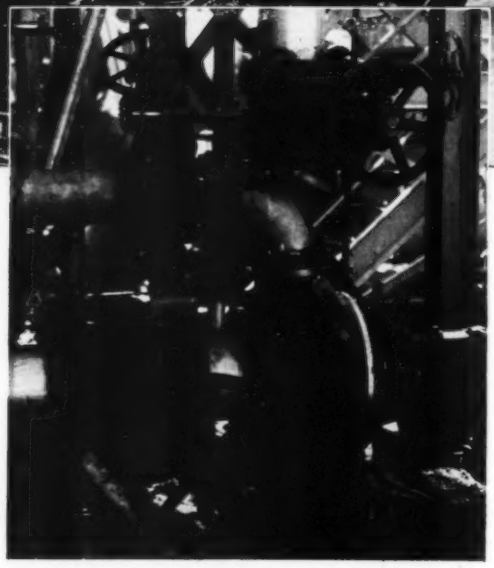
Like American Potash, you'll find that OIC *makes a valve to fill your specific requirements.*

If you'd like to discuss your valve problems with valve experts, see your OIC Distributor, or write direct to OIC.



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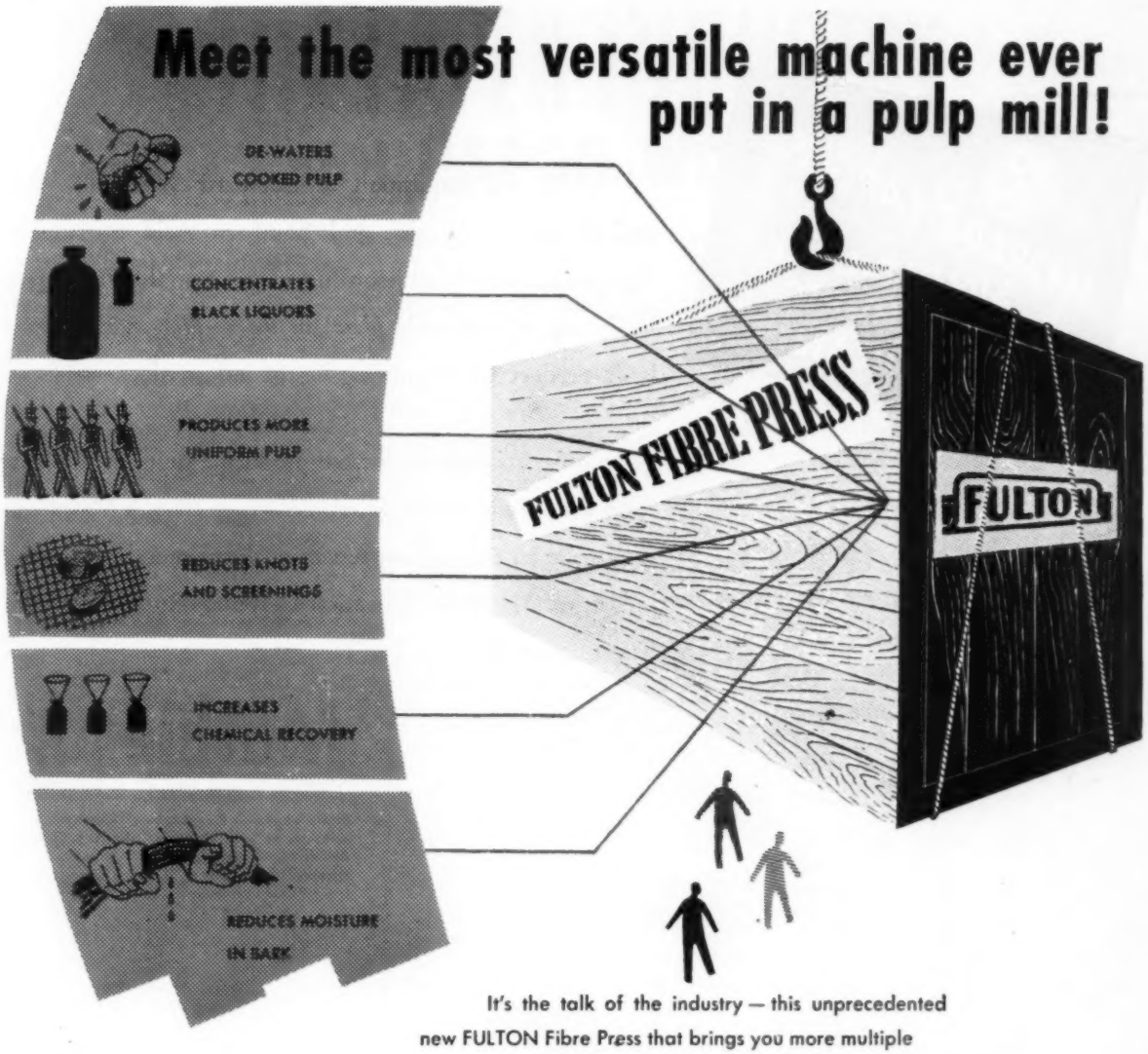

It's the talk of the industry — this unprecedented new FULTON Fibre Press that brings you more multiple benefits from *one operation* than anything ever introduced in the long history of pulp-making!

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- MINIMIZES YOUR STREAM POLLUTION PROBLEM
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THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

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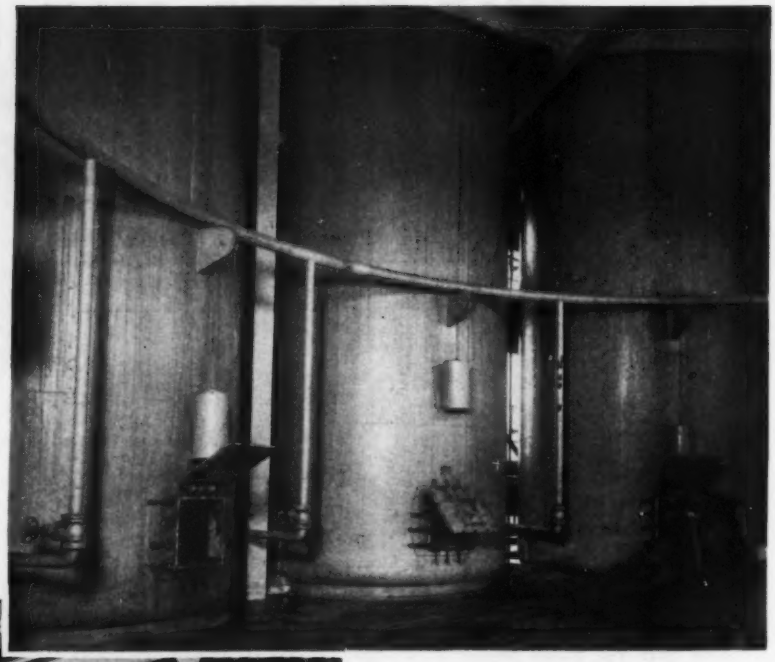
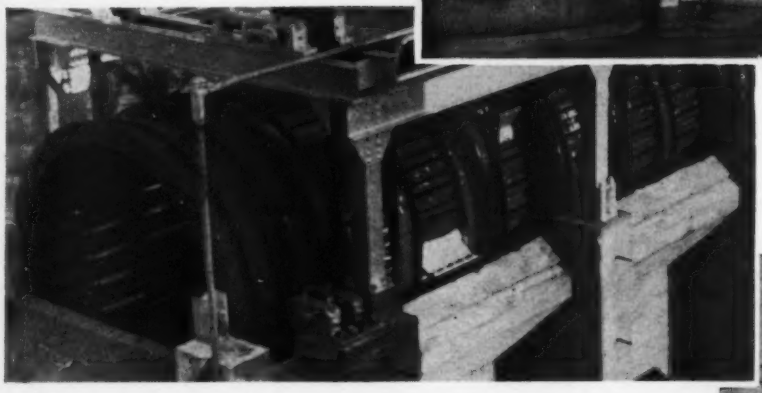
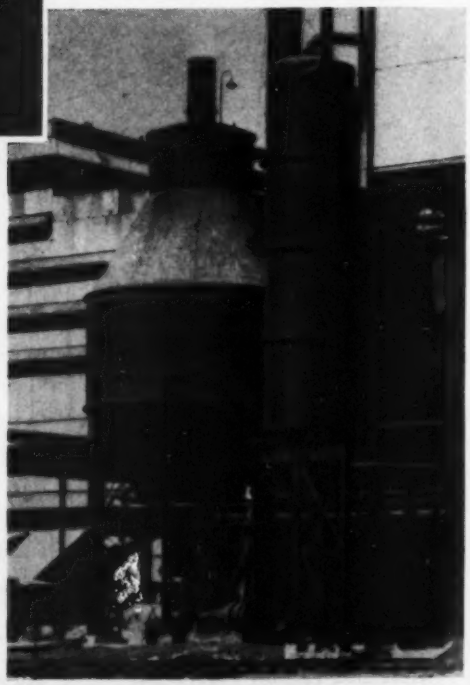




Above: 14 ft. 6 in. diam. by 33 ft. 4 in. diffusers built for the Container Corp. of America, Fernandina, Florida.

At left: Barking Drum built for the Fibre Making Processes Inc. at the Chesapeake-Camp Corp. Mill, Franklin, Virginia.

Below: 26-ft. diam. x 13-ft. elevated blow tank built for the Union Bag and Paper Corporation, Savannah, Georgia.



WHETHER you are modernizing existing facilities or building an entirely new plant, CB&I steel plate containers can help you operate more efficiently and profitably. Experience has proved that the right kind of process equipment can often place your mill in an advantageous position from the standpoint of steady high production at low cost. And our background of experience in steel plate work assures you that the process equipment we build is "right" for the job.

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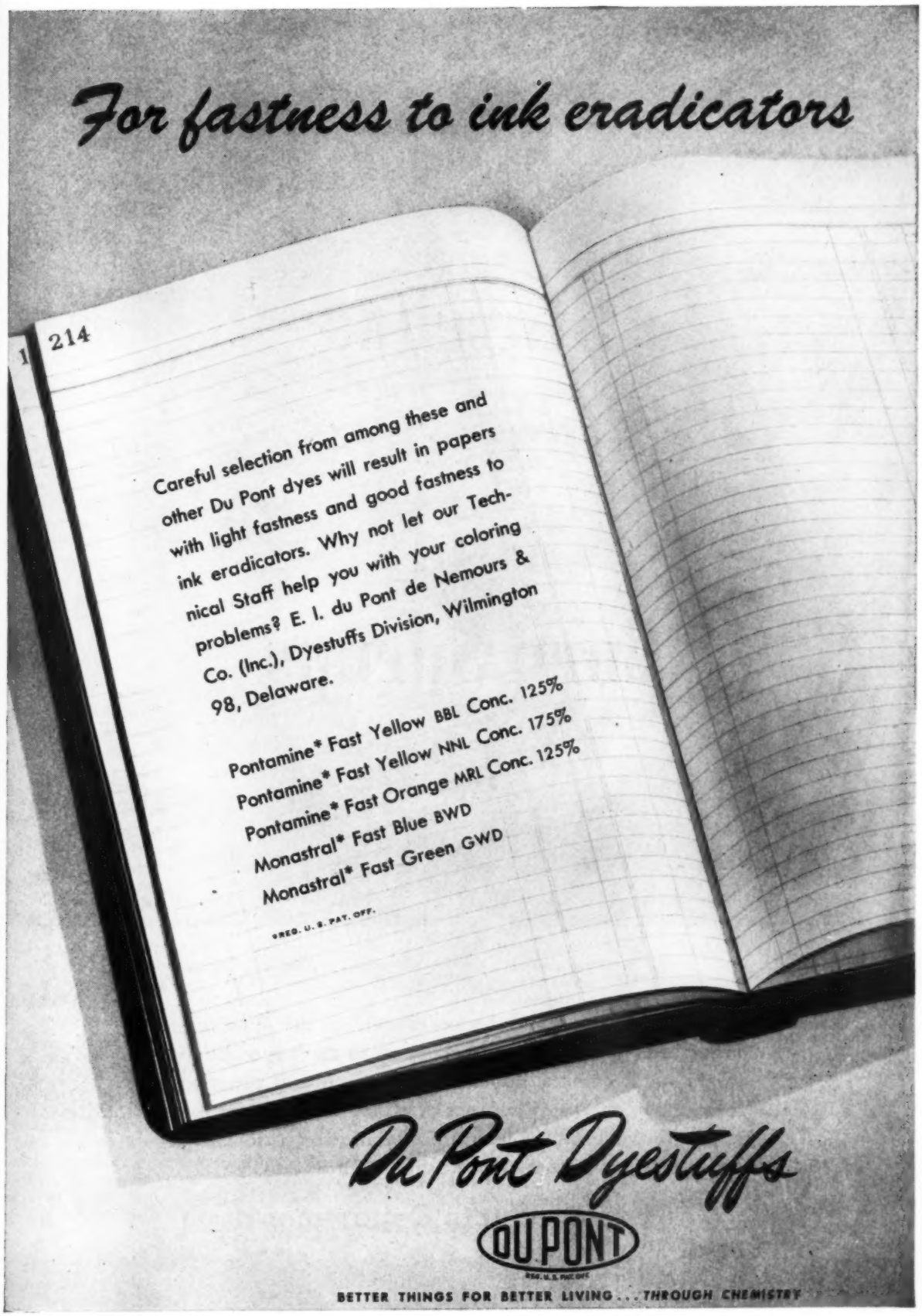
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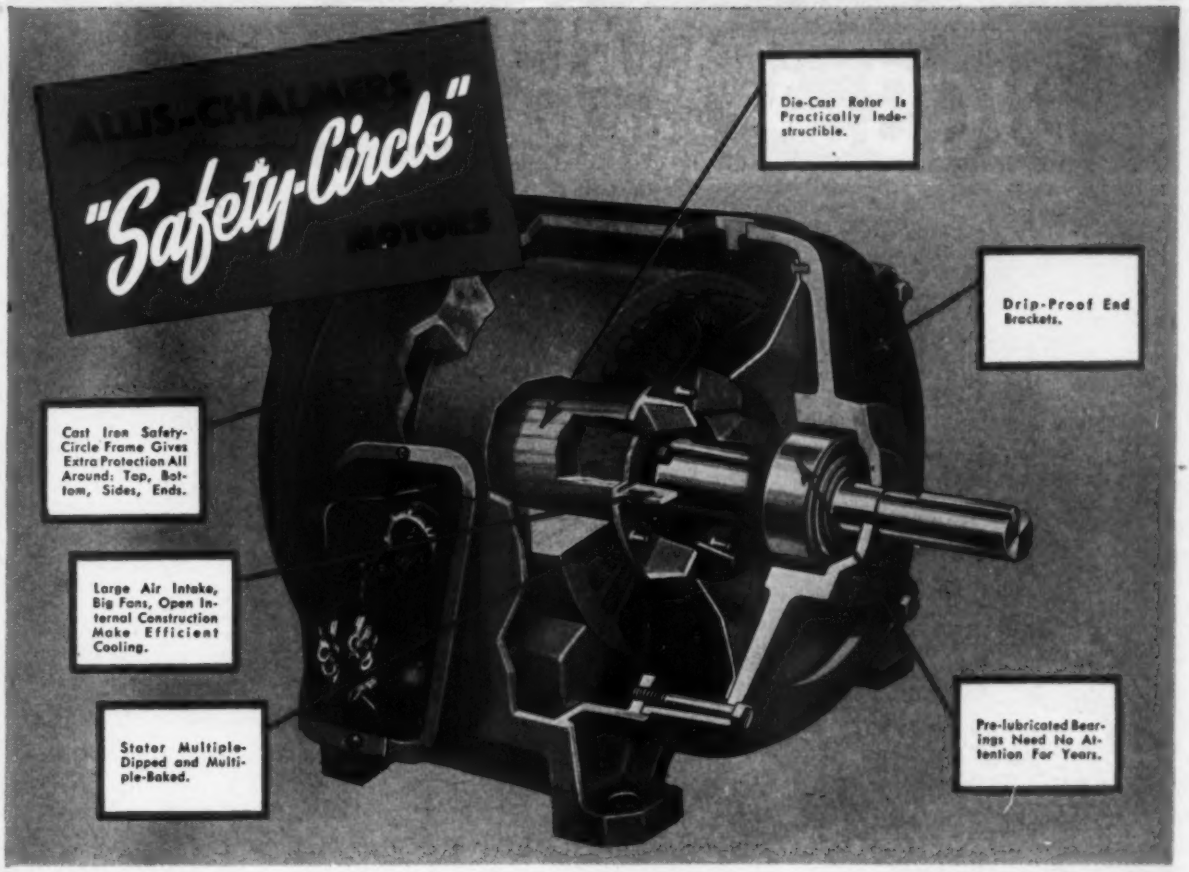
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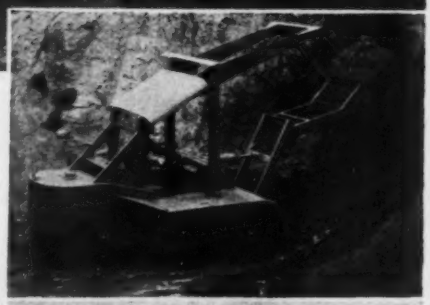

Whether you need it for excavation work or loading from stockpiles or both, you need the new low production cost of the Dempster-Diggster. Here is the only small shovel that works on a hydraulic, simultaneous or independent crowd and hoist action and completely eliminates tractive effort in loading with wheels. Its variable crowd action at any dipper position means the Dempster-Diggster can dig lower . . . 15 inches below grade. Exclusive hoisting action means it can dig higher . . . digs out a 15 ft. bank. It's the only small shovel featuring such speed and mobility . . . travels at truck speeds on the road . . . gets in tight places on big jobs, freeing large shovels for heavier work. Ideal for the small and medium size excavation jobs yet powerful and fast enough for big jobs.

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Laboratory Research...
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Uniform Quality...
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Now that mills are again competing for business, buyers of paper and board are tough customers. They demand tough papers, strong and flexible without being brittle.

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● Miami Woolen Mills ●

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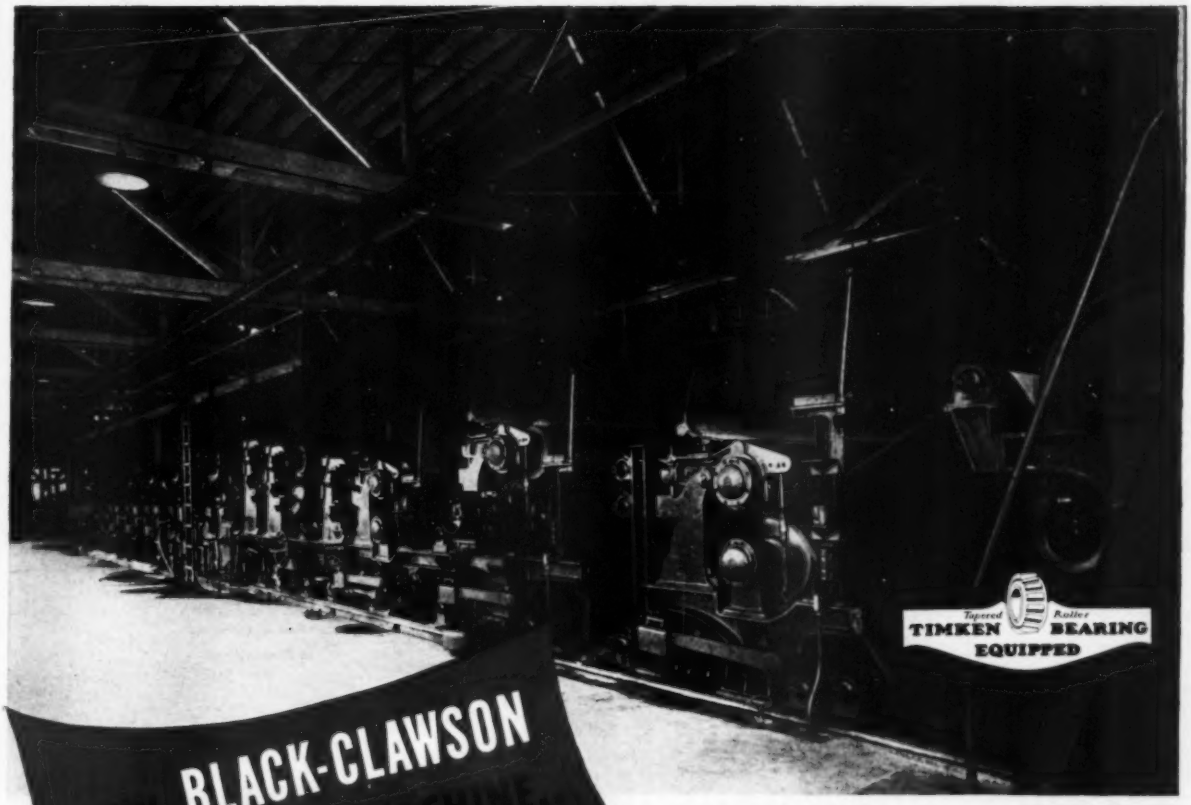
● Established 1858 ●



NEW BLACK-CLAWSON PAPERBOARD MACHINE...

Wet end of Black-Clawson paperboard machine at Angelus Paper Box Company, Los Angeles.

USES TIMKEN® BEARINGS

This is a six-cylinder board unit and represents the latest development in this kind of equipment. It is installed in the new mill of the Angelus Paper Box Company, Los Angeles, California.

In keeping with Black-Clawson practice over a long period of years, Timken tapered roller bearings are used at key positions to promote smooth, frictionless operation; to protect shafts against wear; radial, thrust and combined loads; and to assure constant alignment of moving parts.

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Wherever Timken bearings are applied, better performance, lower maintenance and longer equipment life are the rule. Make sure you have them in the equipment you build or buy. Look for the trade-mark "TIMKEN" on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

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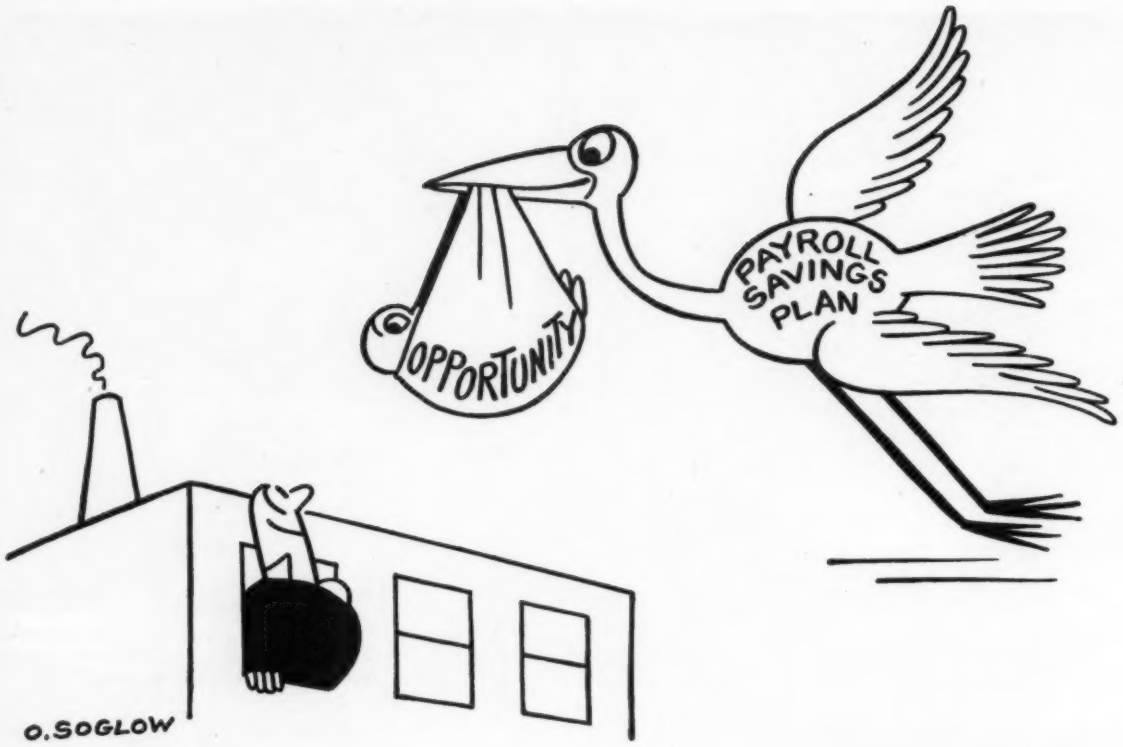

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This program is simply a proved formula for building membership in the Payroll Savings Plan—the "automatic" system by which millions of workers are investing in U. S. Savings Bonds every pay-day.

What Are the Five Steps?

The benefits of the Payroll Savings Plan to your company are in proportion to the percentage of employees who participate. Nation-wide experience indicates that 50% of your employees can be persuaded to join *without high-pressure selling*. Here are five steps which have proved to be the "magic formula" for putting over the Plan. They will get results for you:

1. See that a top management man sponsors the Plan.
2. Secure the help of the employee organizations in promoting it.
3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Plan's benefits to them.
4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Check up on the Payroll Savings Plan in your company. If fewer than half of your employees are participating, you have a lot to gain by following the five-step program outlined here. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. While it's on your mind, why not call him right now? Or write the Treasury Department, Washington 25, D. C.

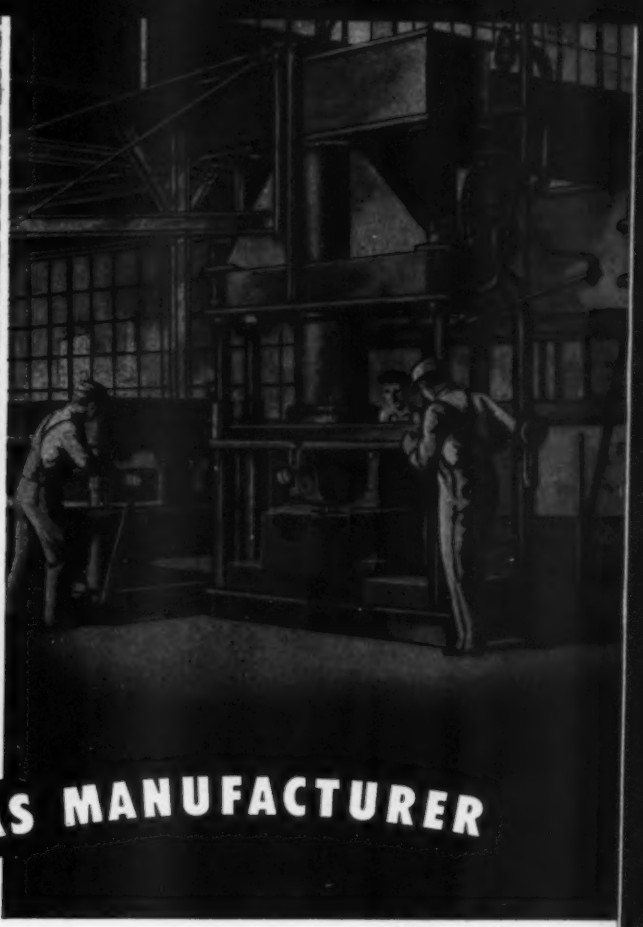
Are You With It?

In the current national Savings Bonds campaign, May 16-June 30, the Treasury Department asks each company operating the Payroll Savings Plan to canvass all employees, with the goal of having at least half of them signed up by the end of the month. This advertisement tells how you can achieve that goal most easily.

The Treasury Department acknowledges with appreciation the publication of this message by

The Paper Industry and Paper World

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.



BEING USER AS WELL AS MANUFACTURER

MIDWEST

HAS THE "Customer's Viewpoint"

ON PIPE WELDING FITTINGS

The four Midwest pipe fabricating plants, and the Midwest Contracting Department are among the large users of Midwest Welding Fittings.

Hence, we have the "customer's viewpoint" when it comes to welding fittings. We know from our own experience what characteristics welding fittings must have to simplify piping layout . . . to reduce welding time . . . to improve piping design. The welding fittings manufacturing department always has the benefit of our extensive user experience.

This situation is one important reason for the high quality and exceptional practicality of all Midwest Welding Fittings. Also important are the laboratory control of manufacturing procedures and the program of continuous research in piping and welding problems.

For more information about Midwest Welding Fittings, get in touch with the local distributor or our nearest office.

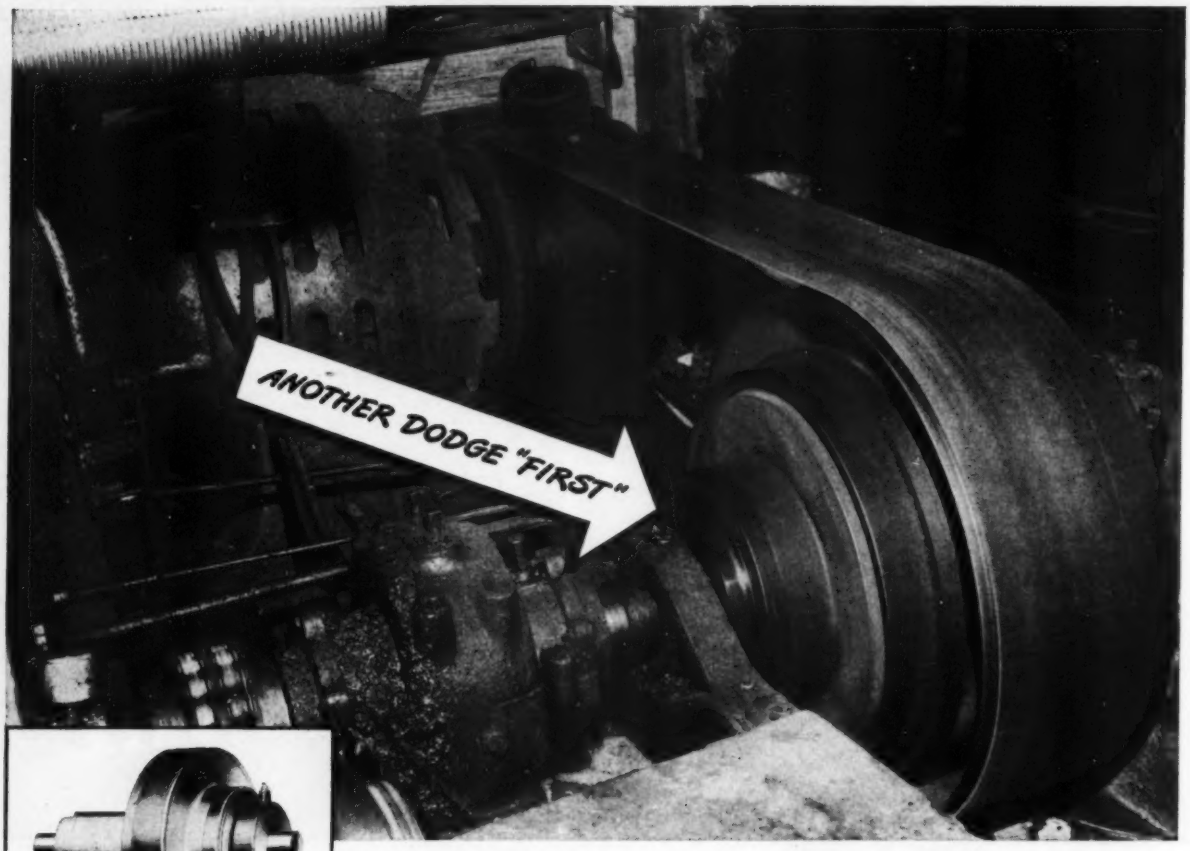
MIDWEST PIPING & SUPPLY CO., Inc.

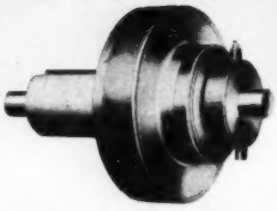
Main Offices: 1450 So. Second Street, St. Louis 4, Mo.

Sales Offices: New York 7—30 Church St. • Chicago 3—79 W. Monroe St. • Los Angeles 33 — 520 Anderson St. • Houston 2 — 229 Shell Bldg. • Tulsa 3—533 Mayo Bldg. • South Boston 27—426 First St.

Stocking Distributors in All Principal Cities

WELDING FITTINGS IMPROVE DESIGN AND REDUCE PIPING COSTS





Over 50 years of experience in the manufacture of industrial clutches have gone into the development of the famous Dodge Diamond D Friction Clutch — noted for its ruggedness and simple, one-point adjustment.

"SHOCK" TROUBLE?

Here's one way to lick it!

HERE A Dodge Diamond D Clutch takes the tremendous shock loads of a veneer peeler lathe. Huge logs are revolved and "peeled" by knives, with 150 to 200 engagements per hour! Precision-built clutches, capable of performing dependably where profits depend upon uninterrupted operation, are another Dodge "first"—one of many Dodge "firsts" in the field of power transmission machinery.

For information on how Dodge products can improve machine performance, save power and keep production steady, call the Transmissioneer, your local Dodge Distributor. He has information on new and better developments for the mechanical transmission of power.

DODGE MANUFACTURING CORPORATION • MISHAWAKA, INDIANA

TAPER-LOCK SHEAVE
Simplest, surest mechanism ever devised for holding wheels to shafts.

DODGE-TIMKEN BEARINGS
save power on millions of industry's toughest jobs.

ROLLING GRIP CLUTCH
No toggles! Compact. Extreme flexibility with positive drive.

TAPER-LOCK FLEXIBLE COUPLING
Available from stock ready to install *without reboring!*

FIRST IN POWER TRANSMISSION MACHINERY!

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER
—graduate of a Dodge factory course, qualified to help on your power transmission problems. Look for his name under "Power Transmission Equipment" in your classified telephone book

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

MARATHON *Speeds* PULP PRODUCTION WITH 7 YARWAY DIGESTER VALVES

At this "world's most modern pulp mill" seven Yarway 8-inch Motor-Operated Digester Blow Valves are on the job, discharging the contents of huge digesters through the blow lines into the blow tanks.

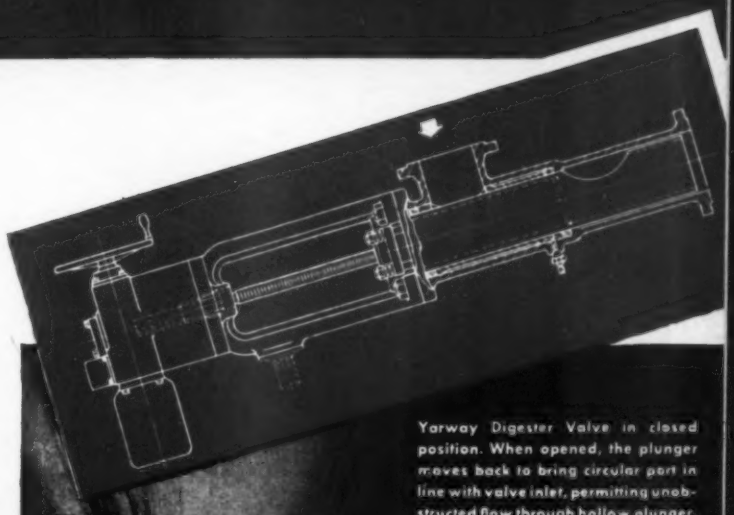
Throughout the paper industry, Yarway Digester Valves are outstandingly successful. The famous Yarway *Seatless* principle, assures a *tight* valve—effectively sealing off the digester, preventing loss of black liquor, increasing number of cooks per day.

Metallurgical advancements permit Yarway Digester Valves to withstand the high pressure, shock and chemical action always encountered in this rigorous service.

In one mill, Yarway Valves increased production 1½ to 2 cooks a day. Another reports maintenance is lower than on any other type. The Motor Control on these valves is so simple, anyone can operate them.

For more information on these production-boosting digester valves, write . . .

YARNALL-WARING COMPANY
149 Mermaid Ave., Philadelphia 18, Pa.



Yarway Digester Valve in closed position. When opened, the plunger moves back to bring circular part in line with valve inlet, permitting unobstructed flow through hollow plunger.

Yarway Motor-Operated Digester Valve in Marathon plant—one of seven installed here.

YARWAY BLOW-OFF VALVES

Cotton Rolls	Granite Press Rolls	Ventilating Fans
Interleaved Rolls	Glassine Supercalenders	Rag Cutters
Paper Rolls	Web Supercalenders	Paper Dampeners
Embossing Rolls	Friction Calenders	Tensile Testers
Chilled Iron Rolls	Embossing Calenders	Mullen Testers
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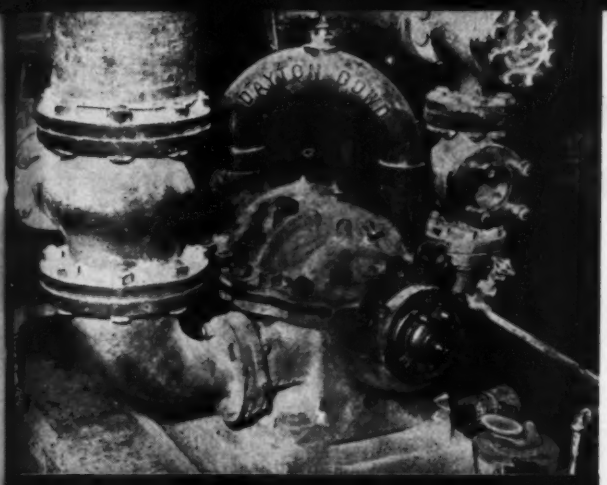
B. F. PERKINS & SON, Inc.

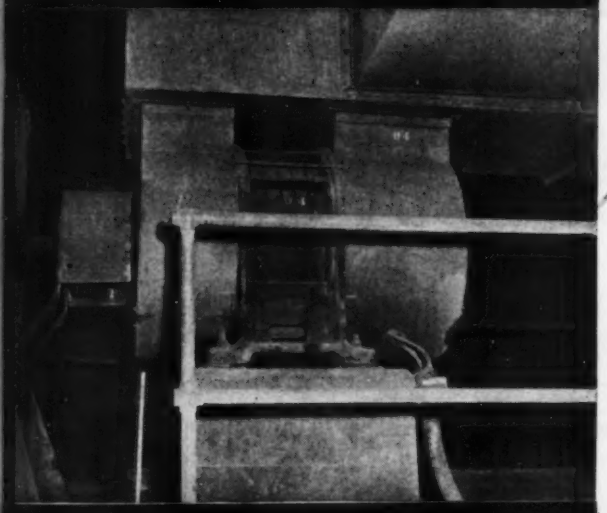
ENGINEERS AND MANUFACTURERS

HOLYOKE, MASS.

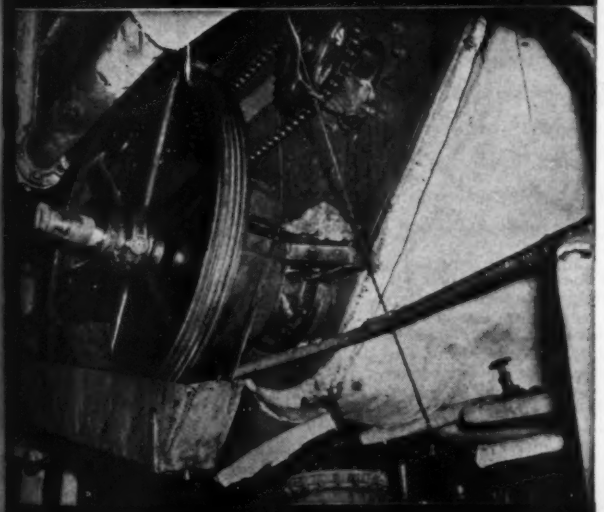
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD



EED WATER PUMP . . . 200° F.



AIR FAN . . . OVER 300° F.



GAR MIXER . . . 150° TO 250° F.

Now, one grease withstands both heat and water

BEARING LUBRICATION posed a continual problem for a midwest sugar-refining company.

The ball bearings in feed-water pumps operate around 200° F. and, in addition, are exposed to the washing action of water. The ball bearings in air fans have operating temperatures over 300° F. The shaft bushings in a sugar mixer operate at around 200° F. and are subjected to continuous attack by the sugar-water mixture.

These conditions proved too severe for conventional greases. Bearings failed frequently. Maintenance costs were high. A Standard Oil Lubrication Engineer tackled the problem. He suggested the use of Stanolith Grease—a lithium soap product with the unusual ability to withstand both high temperatures and the washing action of water.

The switch to Stanolith has eliminated bearing maintenance for the feed-water pumps. Bearings in the air fans have been kept in almost continuous operation. On the most difficult job of all, Stanolith has prevented bearing wear and seizure troubles in the sugar mixer. Costly shutdowns and repairs of the mixer have been eliminated.

Where both heat and water interfere with lubrication of your equipment, try Stanolith Grease. A Standard Oil Lubrication Engineer will be glad to give you more information about this versatile product.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Ill.

Stanolith Grease

TANDARD OIL COMPANY (INDIANA) STANDARD

Why buy piping the hard way When CRANE supplies everything?

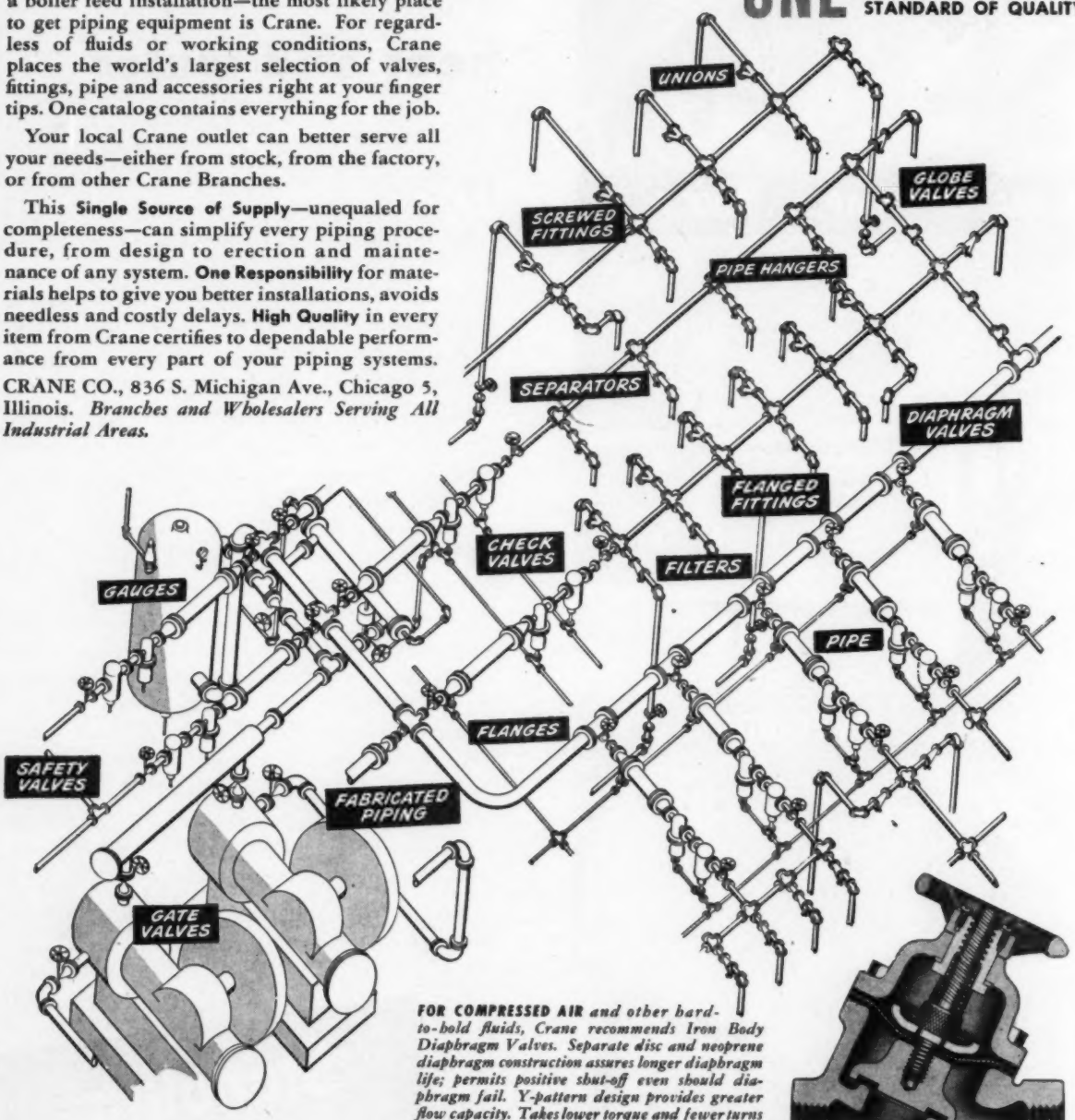
ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY

For Air Service Piping—as for a superheater or a boiler feed installation—the most likely place to get piping equipment is Crane. For regardless of fluids or working conditions, Crane places the world's largest selection of valves, fittings, pipe and accessories right at your finger tips. One catalog contains everything for the job.

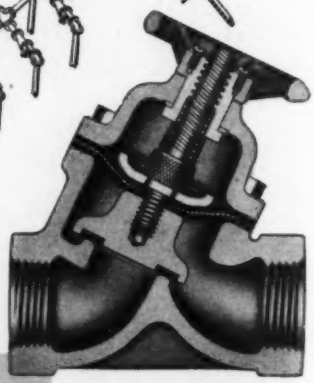
Your local Crane outlet can better serve all your needs—either from stock, from the factory, or from other Crane Branches.

This **Single Source of Supply**—unequaled for completeness—can simplify every piping procedure, from design to erection and maintenance of any system. **One Responsibility** for materials helps to give you better installations, avoids needless and costly delays. **High Quality** in every item from Crane certifies to dependable performance from every part of your piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Illinois. *Branches and Wholesalers Serving All Industrial Areas.*



FOR COMPRESSED AIR *and other hard-to-hold fluids, Crane recommends Iron Body Diaphragm Valves. Separate disc and neoprene diaphragm construction assures longer diaphragm life; permits positive shut-off even should diaphragm fail. Y-pattern design provides greater flow capacity. Takes lower torque and fewer turns to open or close. Working pressure: 150 pounds, max.; 180 deg. F. max. Sizes: ½ to 4-inch. Write for folder AD-1761.*



EVERYTHING FROM . . .

VALVES • FITTINGS
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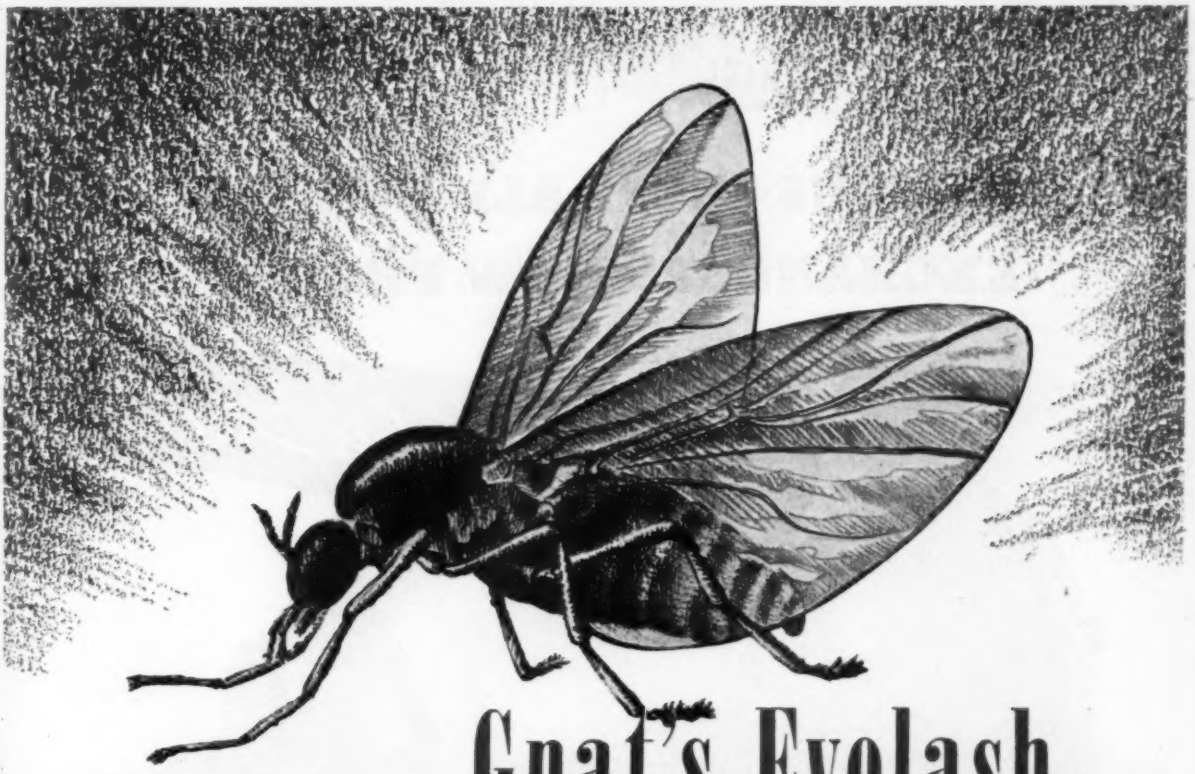
CRANE

FOR EVERY PIPING SYSTEM



WITHIN A Gnat's Eyelash

We haven't the faintest idea as to the diameter of a gnat's eyelash (and care less), but we do know that the new Downingtown Duplex Cutter and Slitter gives accuracy of sheet length to within .0625 which everyone knows is cutting to "within a gnat's eyelash." You're assured of this kind of accuracy and positive squareness of the sheet with the completely re-designed, modern Downingtown Duplex Cutter and Slitter, because of its POSITIVE DRIVE ADJUSTMENT. Unique features, not found in any other machines of this type, assure (1) greatly reduced secondary trimming (2) absolutely minimum wastage (3) continuous high speed operation (all bearings are oversize, anti-friction type), (4) ease of passing sheet and (5) ease and simplicity of slitter adjustment or removal, while running.

This new Downingtown Duplex Cutter and Slitter "must be good," because it hasn't been on the market very long and already eight have been sold, which includes a repeat order from one customer. What more need we say, other than to remind you that, if you want to reduce your cutting and slitting spoilage and maintenance to "within a gnat's eyelash," fill in and mail the coupon today.

BLUEPRINT FREE—NO OBLIGATION

Downingtown Mfg. Co.
Downingtown 3, Pa.

Please send me a blueprint of your new Duplex Cutter and Slitter, and a summary of its many unique features.

Name _____

Title _____

Company _____

Address _____

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DOWNINGTOWN, PA.

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BY INDUSTRY-WIDE REQUEST

FAMOUS "BCF" ALL-PURPOSE EXCHANGERS NOW PRODUCED IN

All-Stainless Steel

At low unit cost!

Your industry asked for it. So here it is ...the first fully standardized, all-stainless steel shell and tube exchanger... identical in design and dimensions to its cuprous counterpart, the world-famed "BCF" ...and like it, mass produced!

DESIGNATED TYPE "SSCF," this addition to the Ross line will prove particularly valuable to you as a low cost, immediately available, stainless steel exchanger for service where oils or other fluids may be contaminated by other metals.

As an original equipment manufacturer furnishing exchangers as part of your package, as an equipment user, or as a processor, you will be interested in the cost-saving and time-saving advantages resulting from Ross' full standardization and mass production of this new Type "SSCF" Stainless Steel Exchanger.

NEW BULLETIN Become familiar immediately with the new "SSCF." Write for Bulletin 1.7K1. Complete design details and sizes.

ROSS

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Easy as fixing a faucet

THE GRINNELL-SAUNDERS DIAPHRAGM VALVE has only one part that normally wears and needs replacement . . . the diaphragm. Depending on the type of service, it may last for years or only months. It can be replaced in just a few minutes. The valve body doesn't have to be removed from the pipe line . . . only the bonnet. The new diaphragm is attached to the bonnet which is then bolted back onto the valve body . . . and the valve is restored to service. That's all the maintenance a Grinnell-Saunders Diaphragm Valve normally needs. No packing glands to demand frequent attention. No refacing or reseating required, because there are no metal-to-metal seats to become damaged or wire drawn.

SIMPLE, POSITIVE OPERATION . . . Flexible diaphragm opens wide for streamlined flow, pinches tight for positive closure even when grit, scale or other solid matter is trapped on the weir.

NO CLOGGING . . . MINIMUM RESISTANCE TO FLOW . . . Smooth, streamlined fluid passage without pockets prevents accumulation of sludge and reduces friction resistance to a minimum.

NO CORROSION . . . NO CONTAMINATION . . . NO LEAKS . . . The working parts of the valve are completely isolated from the fluid by the diaphragm. Diaphragm materials, body materials and body linings are available to suit service requirements.

Available in various combinations of valve bodies and operating mechanisms. Write for catalog.

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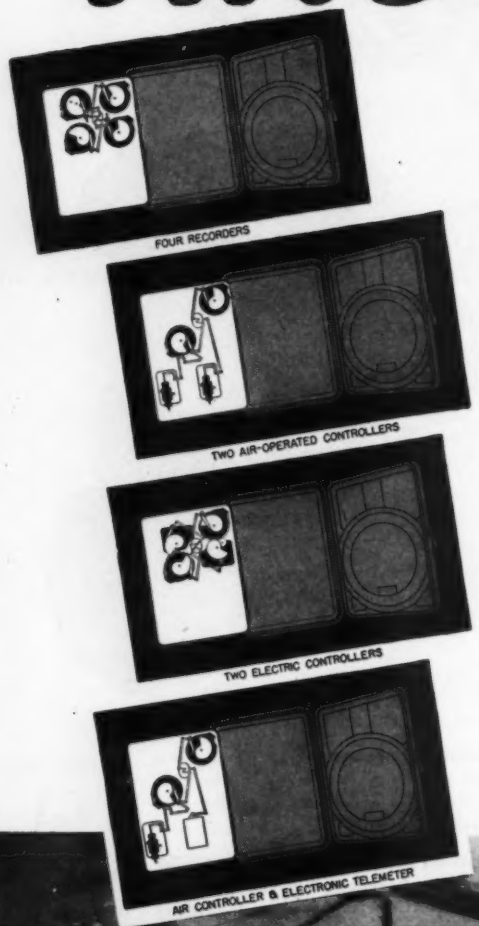

FROM 4 CIRCUITS AND 8 BASIC PARTS

What's your control problem? Flow—temperature—level? Are you using solids—liquids—gases?

No matter what you process, four basic circuits and eight basic component parts will give you more than 100,000 different electronic measuring and controlling combinations. That's how Bailey has simplified controls for processing industries.

The four arrangements illustrated show how easily Bailey interchangeable parts can be used. It's no longer necessary to carry a huge stock of replacement parts for emergency control installations. When you standardize on Bailey controls you are always ready to meet changing conditions within your plant.

And with Bailey simplified controls, your maintenance costs will be less. Maintenance men quickly become familiar with Bailey controls and spend less time on maintenance and installation.

To see for yourself how you can profit with Bailey controls, write for a copy of our bulletin No. 17.

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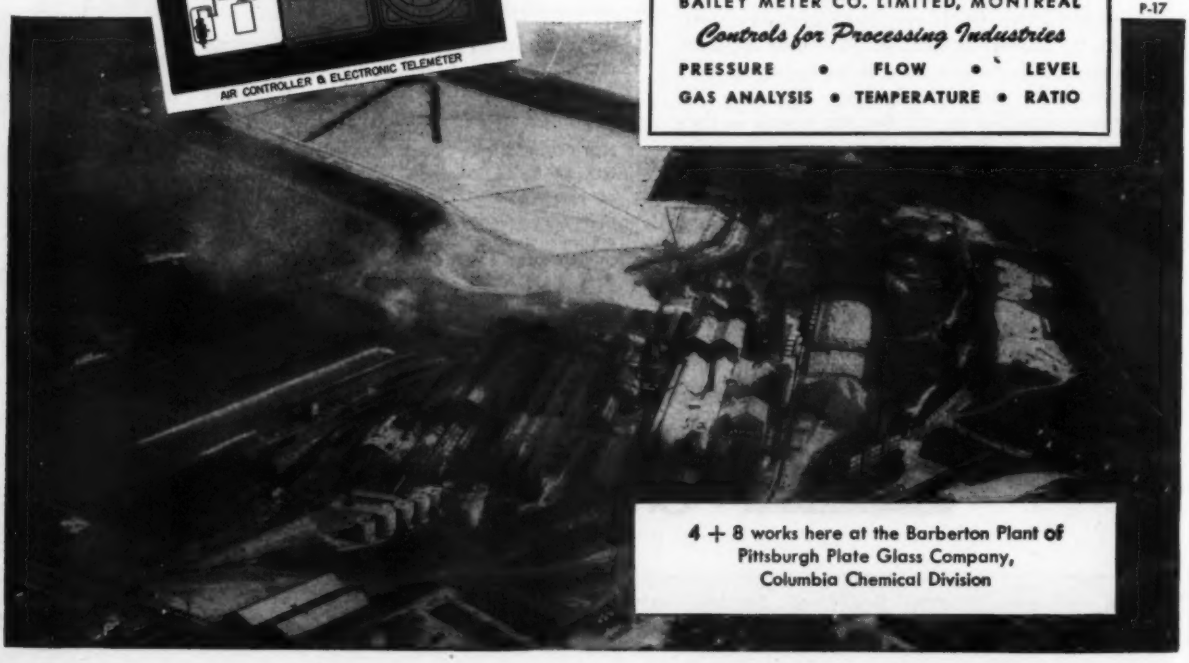
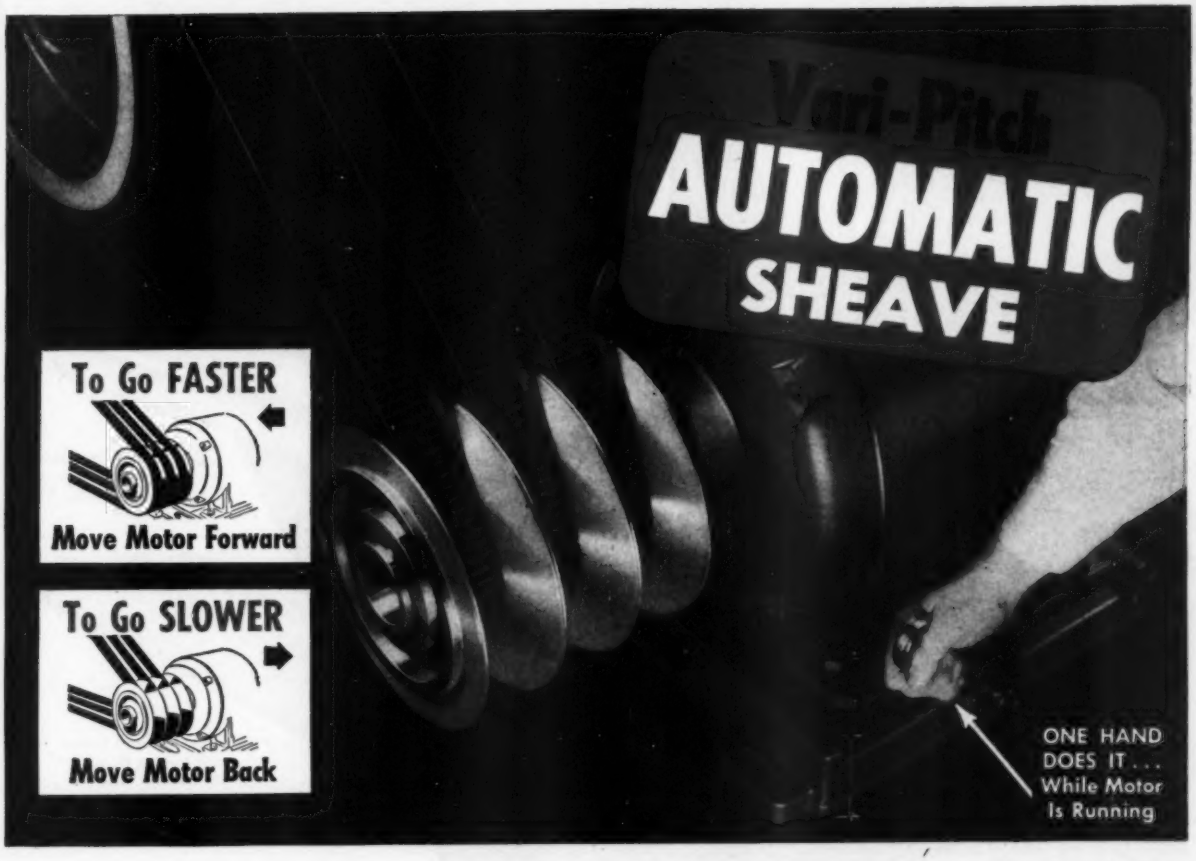


4 + 8 works here at the Barberton Plant of Pittsburgh Plate Glass Company, Columbia Chemical Division



New Texrope Sheave Gives Lowest Cost

Instant Speed Control

- Covers most speed changing needs from 3 to 20 hp
- Very simple — one sheave does all
- Infinitely variable speed — 100% increase; 2 to 1 range.

THE NEW *Vari-Pitch* AUTOMATIC SHEAVE is the simplest, most economical method of instant speed control ever devised. You just move the motor forward to increase speed and move the motor back to decrease. The *Vari-Pitch* Automatic Sheave changes pitch diameter and holds the belts at proper tension *automatically.*

Now, you can cut unit costs by operating machines at most efficient speed . . . improve quality by compensating for material variation . . . with a very small investment in new equipment. Today, ask your A-C Authorized Dealer or Sales Office to give you complete facts and figures on how the new *Vari-Pitch* Automatic Sheave can save money in your plant. Or write for bulletin 20B7223. A-2767

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CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

Centrifugal roll—cast from Thermalloy "30".
Radiant Tube Assembly —Centrifugally cast from Thermalloy "40".
Centrifugal Retort Tubes and Locking Plugs. Thermalloy "40-B".
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Let's talk *FACTS* about CENTRIFUGAL CASTINGS

We make both centrifugal castings and static castings. We don't make a blanket claim that centrifugal castings are denser, more uniform or stronger. In certain cases, this has proved to be true. But for all practical purposes, the differences in physical properties are almost negligible.

Lower cost is the big advantage. Pattern costs and pound prices are usually less with centrifugal castings . . . because cores are eliminated and molding time is reduced.

The amount and location of machining must be considered. Centrifugal casting produces a good outside surface suitable for machining. However, shrinkage areas are usually found on the inside surface, necessitating expensive machining if a finished surface is required.

Thinner wall sections can be produced more economically in large diameters by centrifugal casting than by static casting.

We recommend that you let our experienced metallurgists work with you in selecting the most economical type of casting for your particular application. You may be sure of a practical and unbiased recommendation. Call your nearest Electro-Alloys engineer, or write Electro-Alloys Division, 2023 Taylor Street, Elyria, Ohio.

Specify *CHEMALLOY for corrosion resistance**

***THERMALLOY** for heat and abrasion resistance*

*Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY

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ELYRIA, OHIO

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PAPER ANNUAL

1949-1950

Presented as a Service to Members of the Paper Industry

WILLIAM L. BARRELL COMPANY
LAWRENCE, MASSACHUSETTS

VOL. VIII

1949-1950

CONTENTS

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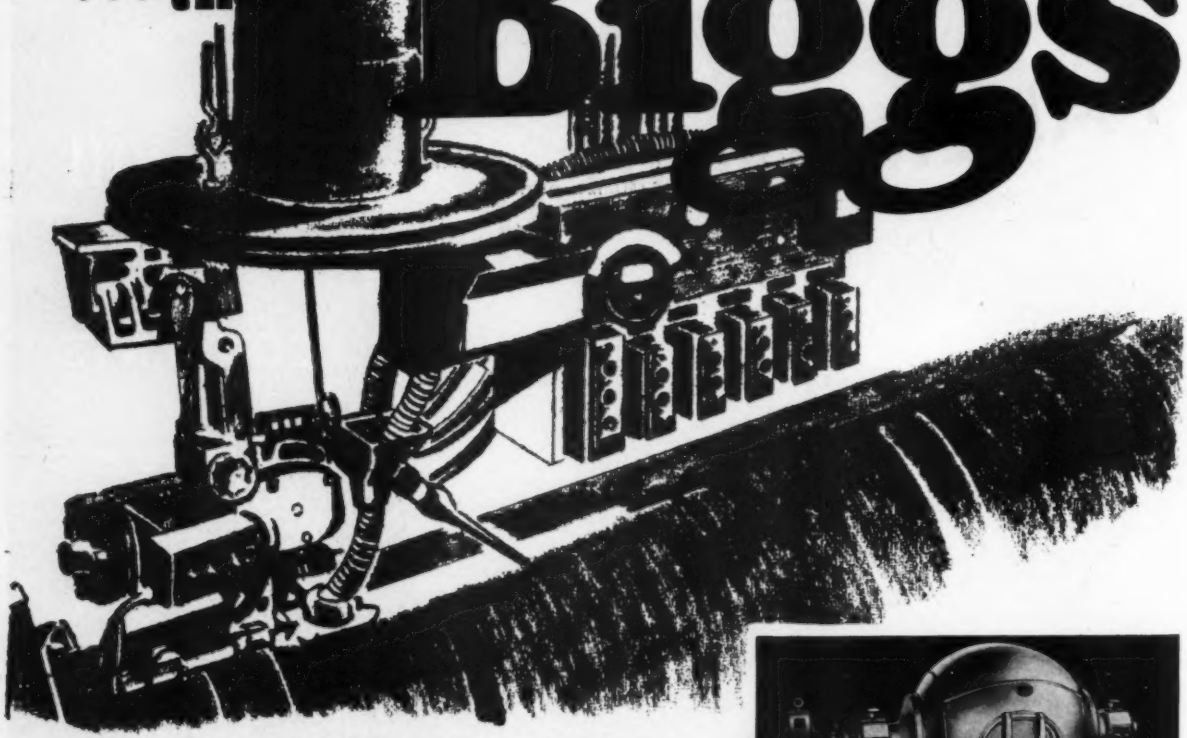
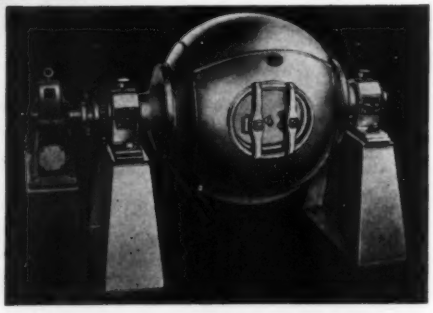
HEAVY PLATE FABRICATORS FOR INDUSTRY

. . . th[illegible] Biggs





BIGGS built . . . laboratory type digester

SAVE ENGINEERING COSTS!

FOR THE PULP AND PAPER PROCESSING EQUIPMENT YOU NEED *TOMORROW*, CALL ON BIGGS *TODAY!*

Biggs fabricates just about any equipment you need and can save you money on your engineering—

Because . . .

1 We have standard paper mill equipment in our regular line on which we can give you prompt quotations and "quicker-than-quick" delivery—DIGESTERS, BLEACHING TANKS, RETORTS, STACKS, etc.

2 In our 62 years, Biggs has designed, built and installed a tremendous amount of specialized paper mill equipment. Check us—it's very likely one of Biggs' "proved-in-service" designs is just what you're looking for.

3 If your requirements call for a "tailored" job, Biggs can either build it from your blueprints, or handle the entire job for you—from drawing board to final installation of finished equipment.

Call, wire or write us and a Biggs man will be out promptly and go over your job with you.

BOILER WORKS CO. the Biggs AKRON OHIO

ALL PRODUCTS WELDED TO CODE REQUIREMENTS

Carbon Steel • Special Steel
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BB-549-25

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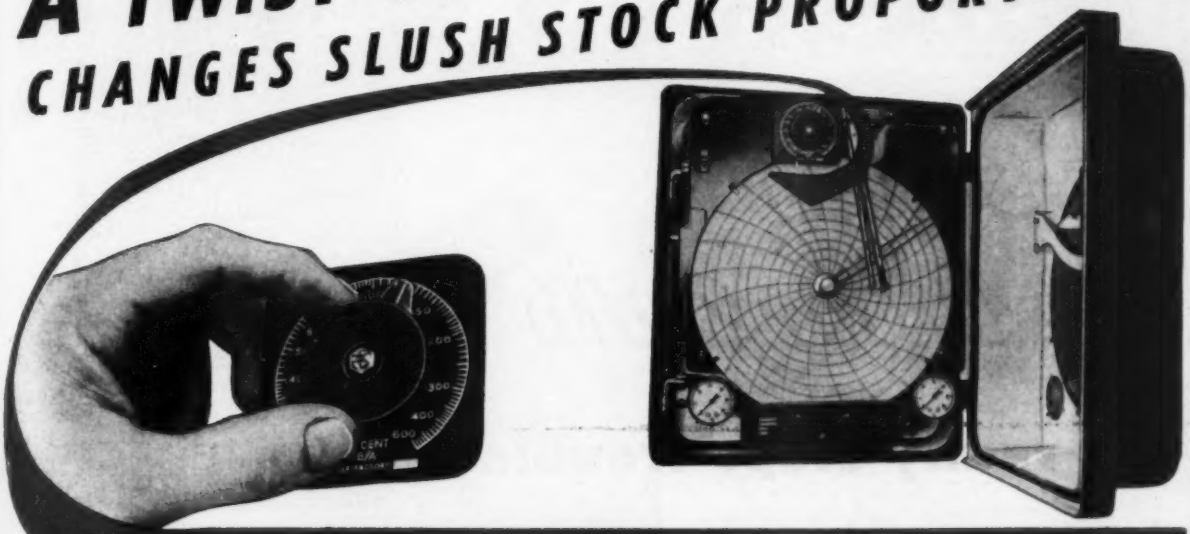
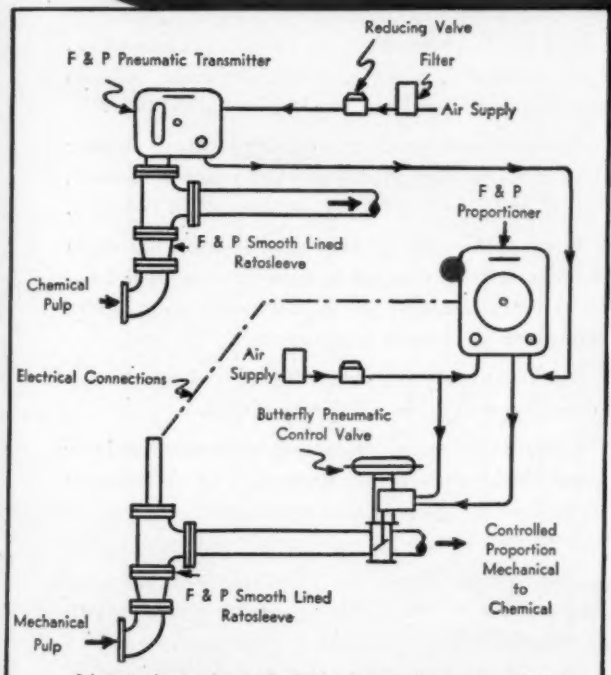
A TWIST OF THE WRIST
CHANGES SLUSH STOCK PROPORTIONS



THE NEW F & P PULP PROPORTIONING SYSTEM



Schematic drawing showing the F & P pulp proportioning system. Additional FLOWRATOR instruments are used when fluids such as broke, alum, and color are tied into the main line.

- ***Eliminates Head Boxes***
- ***Eliminates Pulp Return Lines***
- ***Provides "Basis Weight" Control***
- ***Saves Floor Space***
- ***Records and Totalizes Pulp Flow***

● Yes and more! The new F & P slush stock proportioning system . . . based upon the modern science of instrumentation . . . is rapidly replacing cumbersome and bulky compartment type feeders.

F & P INTEGRATED control systems start at the paper machine and, from the measurement of its speed, control pulp flow rate. Stock chest level . . . chemical to mechanical pulp ratio . . . size . . . color and filler flow rates are all "tuned" to exact proportion by a simple-

TWIST OF THE WRIST.

Write for technical bulletin "New Developments in Pulp and Paper Mill Instrumentation."

FISCHER & PORTER CO.
Dept. 9S-1F, Hatboro, Pa.

FLOWRATOR
TRADE MARK

INSTRUMENTS FOR FLOW RATE MEASUREMENT AND AUTOMATIC FLOW CONTROL

This Screen and Filter Cloth really stops trouble!

What kind of "trouble" is cutting down the life of your filtering, screening or conveying cloth?

Is it rust . . . corrosion . . . vibration . . . impact . . . wear . . . heat . . . cold . . . high pressures? Or, does your trouble stem from product contamination?

If any of these is your particular problem, consider the relief you'd get from wire cloth made of Monel*, Nickel or Inconel*. . . the "task metals" of industry.

Wire cloth made of the "task metals" has extra strength to resist damage by heavy pressures and impact; extra hardness to resist abrasive wear; extra endurance at extreme temperatures.

It is completely rustproof; highly resistant to corrosion by most acids, alkalies and salts.

Compare its many advantages with any fabric or metal cloth you now use. Better yet, prove its merit to yourself by making a comparative-life test right in your own plant.

And, did you know this? The easy-working qualities of these metals enable weavers to produce cloth of Monel, Nickel or Inconel at prices comparable to what you are now paying for less durable metals. *Fine weaves of Monel and Nickel often cost less!*

All weaves and meshes *are available. Corrosion-resisting seams are easily made by brazing, soldering or welding. Write Frank Bailey of Inco for booklet,* "ESTABLISHED WEAVERS."

Monel* Nickel Inconel*

"Task Metals" for Industry

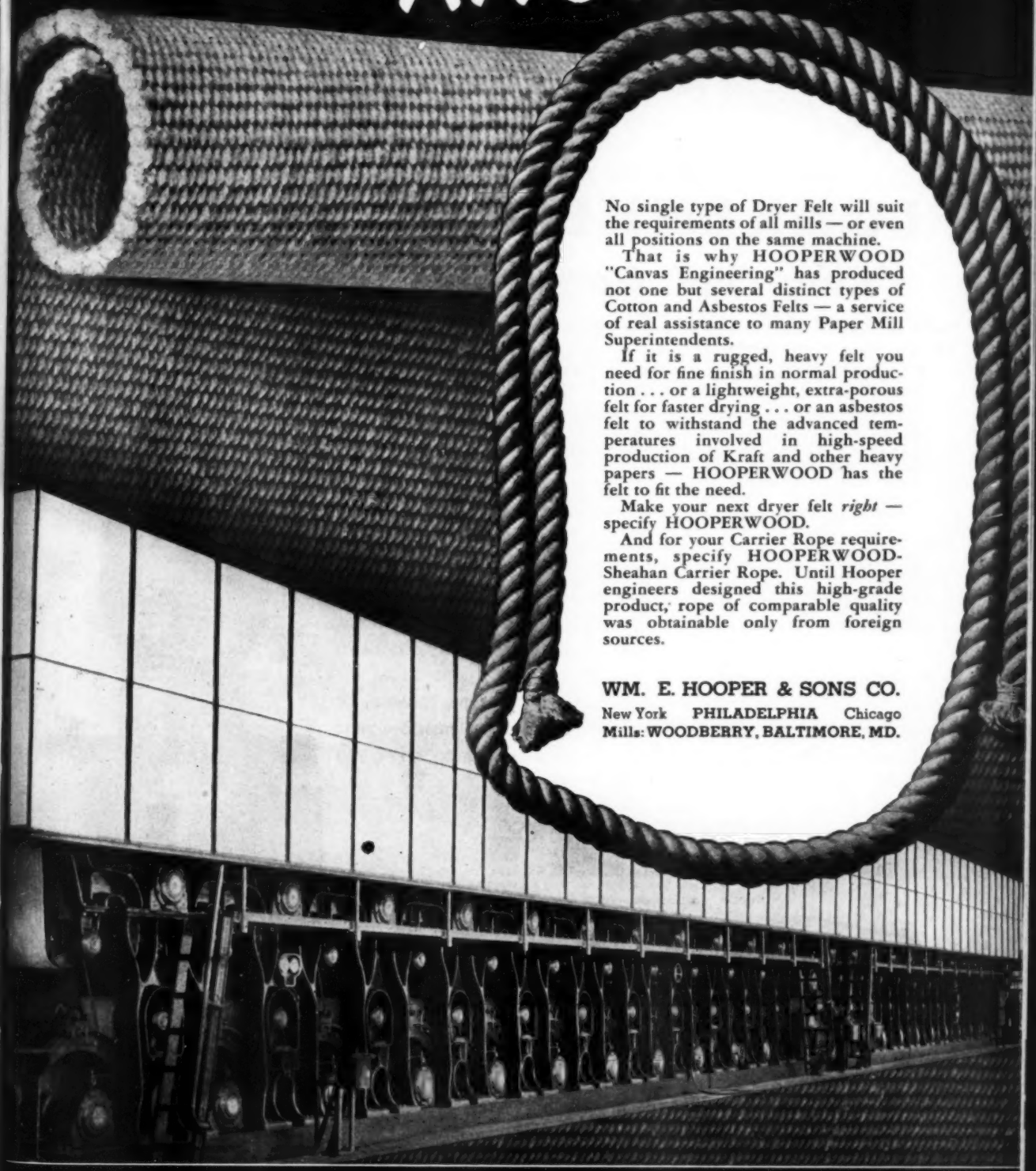
EMBLEM OF SERVICE INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

*Reg. U. S. Pat. Off.

WHAT EVERY PAPER MAKER KNOWS...



No single type of Dryer Felt will suit the requirements of all mills — or even all positions on the same machine.

That is why HOOPERWOOD "Canvas Engineering" has produced not one but several distinct types of Cotton and Asbestos Felts — a service of real assistance to many Paper Mill Superintendents.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an asbestos felt to withstand the advanced temperatures involved in high-speed production of Kraft and other heavy papers — HOOPERWOOD has the felt to fit the need.

Make your next dryer felt *right* — specify HOOPERWOOD.

And for your Carrier Rope requirements, specify HOOPERWOOD-Sheahan Carrier Rope. Until Hooper engineers designed this high-grade product, rope of comparable quality was obtainable only from foreign sources.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: WOODBERRY, BALTIMORE, MD.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

"The lowest-cost gate valve we have ever used!"

. . . that's what they say about the

LUNKENHEIMER

"King Clip" Gate Valve

There are good reasons why so many valve users prefer "King-Clip" Valves. *Note these features:*

Exceptionally strong body and bonnet construction.
Extra length pipe threads for a strong, safe joint.
Sharply tapered disc seats tightly.
Large, unobstructed channels really drain the bonnet.
Coarse stuffing box threads provide greater resistance to corrosion and stripping . . . reduce annoyance of leaky stuffing boxes.
Easy to disassemble and reassemble.
Exceptionally low maintenance cost.
In bronze mounted patterns, rolled-in seat rings, integral non-corrodible stem thread bearing and special alloy stem assure longer life.

THE first clip type valve was originally developed many years ago by Lunkenheimer and was one of the most popular gate valves ever designed. As service demands became more severe, the basic design was improved into the present "King-Clip". Twenty-one different patterns are now available for a wide range of service conditions in virtually all industries.

The "King-Clip" is truly the leader of all clip type valves . . . it offers you a money saving solution to many valve problems. See your Lunkenheimer Distributor. He has a stock available to serve you promptly. Write for Circular No. 561.

ESTABLISHED 1862

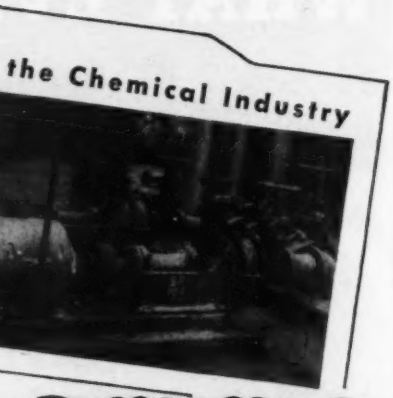
THE LUNKENHEIMER CO.

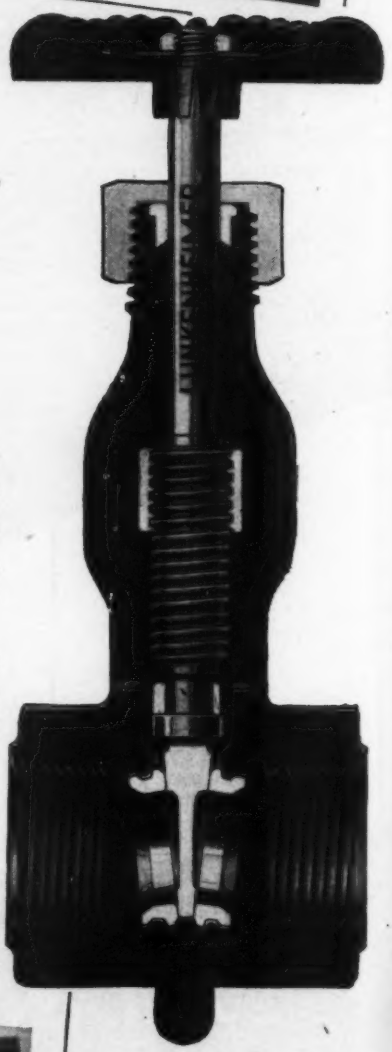
"QUALITY"

CINCINNATI 14, OHIO. U. S. A.

NEW YORK 13 CHICAGO 6 BOSTON 10 PHILADELPHIA 34

EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.





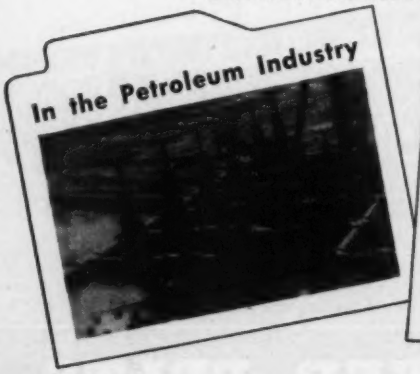


Fig. 1640 Iron Body Bronze Mounted . . . for steam, oil, gas, air, water & gasoline service.

Fig. 1644 All Iron . . . for handling solutions which attack bronze.

You Can't Have Good Paper

Without Good Chemicals . . .

ALUMINUM SULFATE

Standard: Lump; Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh.

Iron Free: Lump, approx. 2½", Ground thru 8 mesh, Liquid, 32° Be.

SODIUM SULFATE

(Salt Cake) . . . Paper Makers' Grade, thru 8 mesh, 95-99% Na_2SO_4.

Chemicals are vital in the manufacture of paper. You can't have good paper without them. That is why particular paper makers, when ordering alum, salt cake and other process chemicals, make sure of quality and *specify "General Chemical."*

Other General Chemical Products For the Paper Industry

- Aqua Ammonia
- Chromium Potassium Sulfate (Potash Chrome Alum)
- Disodium Phosphate (Anhydrous)
- Glauber's Salt (Crystal and Anhydrous)
- Hydrochloric Acid (Muriatic)
- Nitric Acid
- Sodium Bisulfite (Anhydrous)
- Sodium Fluoride
- Sodium Hyposulfite
- Sodium Metasilicate
- Sodium Silicate
- Sodium Sulfide
- Sodium Sulfite (Anhydrous)
- Sodium Thiosulfate
- Sulfuric Acid
- Tetrasodium Pyrophosphate (Anhydrous)
- Trisodium Phosphate

SPECIFY "GENERAL CHEMICAL"

50 YEARS OF SERVICE

BASIC CHEMICALS

FOR AMERICAN INDUSTRY

GENERAL CHEMICAL DIVISION

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40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte Chicago • Cleveland • Denver • Detroit • Houston • Kansas City • Los Angeles • Minneapolis New York • Philadelphia • Pittsburgh • Portland (Ore.) • Providence • San Francisco • Seattle St. Louis • Wenatchee and Yakima (Wash.)

In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

announcing...

Johnson Joints with new . . . SEAL RINGS

These are approximate average increases in ph[illegible] strength of the new Johnson carbon-graphite seal r[illegible]

Transverse Breaking Strength	**Increased**	**40%**
Tensile Strength	**Increased**	**100%**
Compression Strength	**Increased**	**65%**

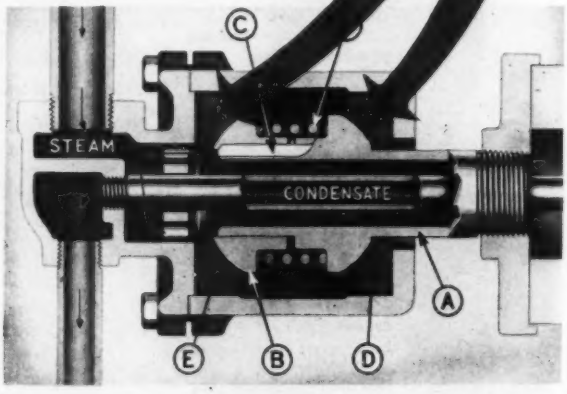
Here's the new Johnson Super seal ring—the result of a new development in compounding and processing carbon-graphite that brings a tremendous advance in physical strength

The carbon-graphite seal rings used in Johnson Rotary Pressure Joints are a big factor in their outstanding performance. Johnson has always played a part in making these rings stronger, longer-lasting.

Now a new method of compounding and processing has been developed which brings a tremendous improvement in the physical properties. The figures above tell the story of this new Super seal ring; these are average increases, and will vary somewhat with the different sizes.

The new Super seal rings are now furnished in the great majority of Johnson Joints, very shortly will be furnished in all sizes. They mean an even greater abundance of the trouble-free, long-life service which has made Johnson Joints first choice of mill operators and machinery manufacturers alike.

[redacted] get these new Johnson Super seal rings. Manufactured precisely to original specifications and tougher, longer-lasting by far.



Puts Johnson Joints Farther Ahead than Ever!

Arrows show new Super seal ring (D) and bearing ring (E) which eliminate oiling and packing and now add longer life and greater resistance to all operating hazards. Nipple (A) is connected to roll or drum. Collar (B) is keyed to nipple at (C) but fits loosely so pressure fills housing and serves as sealing force, making Joint self-adjusting. Spring (F) is for initial seating only. Type B Johnson Joint illustrated; other types, sizes for all needs. Write for literature.

Product of The Johnson Corporation

The Johnson Corporation, 845 Wood St., Three Rivers, Mich.

ROTARY PRESSURE JOINTS • COMPRESSED AIR SEPARATORS AND AFTERCOOLERS
DIRECT OPERATED SOLENOID VALVES • "INSTANT" STEAM WATER HEATERS

THE PAPER INDUSTRY
and PAPER WORLD
JULY 1949

Editorial

It Is Time The Tide Was Turning

▶▶▶ AT THE END OF the second quarter of this year, we can report that all fiscal authorities covering industry and commercial markets agree that "the downward drift in income, production and industrial prices continue to characterize the economy."

However, says the June *Department of Commerce Review*, "Aside from the inventory situation there is little evidence of further deterioration in purchasing by final buyers, below the level reached in the first quarter.

"Consumer spending was maintained in about the same volume that has prevailed all during this year; residential construction was up more than seasonably and business investment in plant and equipment remained high."

Total retail sales have been steady since January and are now a little lower than a year ago.

Manufacturers' sales totals have moved irregularly downward in 1949; they are slightly below a year ago, yet down substantially from the third quarter high of 1948.

The Federal Reserve Bank's Index number of business activity dropped to 174 in May from 179 in April, indicating an activity of business comparable to that of July 1947, when it was 177 . . . that was the figure for that one month only.

The average for the first five months of this year is 183.4.

The average for the year 1947 was 186.6 and 1947 was the second biggest business year in all peacetime records.

The percentage decline in the Index number from the postwar high 195 in October, 1948, through the month of May was 10.7 per cent, an average decline of 1.5 per cent per month.

So while the adjustment of the economy to the postwar demand and supply level is still continuing "the downward drift," yet it is proceeding in an orderly constructive manner with no evidence of demoralization or panic in any quarter. The truth is that demand and supply are seeking a balanced basis which from all apparent indices does not seem to be afar off.

The outstanding road blocks to business recovery are high taxes and the uncertainty concerning the fourth raise in wages.

Every citizen is conscious of the fact that taxes are too high, outrageously too high, and must come down substantially.

Great numbers of the people also are convinced that there must be no general raise in wages now.

Both are inflationary factors and must give way to business in seeking its economic postwar level.

The cost of government must come down just as the cost of production has been obliged to come down.

And finally, all fantastic, unwarranted spending of taxpayers' money by politicians for political purposes must be drastically curtailed.

The Administration continues to demand appropriations for unjustified projects, but Congress is beginning to show signs of turning thumbs down on some of the proposed expenditures.

Public confidence in the present Administration is at a low ebb, the lowest in many years. That loss of confidence will continue until either the Administration does an about-face, forsakes reckless spending and adopts an economic policy, or the Congress must demonstrate it by unmistakable action that the postwar political buggy ride is over. Economy is the watchword from now on.

The paper industry has turned in a very fair record of meeting the conditions sensibly. Production and shipments of paper products into the market have been adjusted to the demand. Inventories at the mills and in the distribution centers have been allowed to decline so that as of June 1, stocks and inventories in the pipe line show no increases in excess of the demand.

A 5 per cent upturn in demand would send consumer and converters scurrying for hurry-up shipments.

Imports of wood pulps from Europe for the first five months show almost a 600 per cent decrease against 1948 figures, while demand for newsprint has increased and consumption thus far this year has reached an all time high record peak increasing 3.5 per cent for the first five months of 1949.

While premiums for tonnage have disappeared for news, yet prices remain stable and unyielding at the $100 per ton contract figure.

We fail to find anything abnormally wrong with the progress of this inevitable postwar adjustment which had to take place in our business economy. Certainly nothing to get excited about.

The political toad in the road which is hindering the return to normal operations will eventually be brought into consonance with our over-all progress. It will take a bit of time yet.

The paper industry is running true to form and its operation in the future will take the pattern of the general over-all business condition, up or down.

Don't worry because the tide has been going out—it always comes back.

Superintendents Association

BOARD OF DIRECTORS meeting—(reading clockwise) Roy Zellers, J. O. Julson, Ray F. Bennett, Fred Boyce, Sidney Brown, W. H. Brydges, Harry E. Weston, O. W. Messner, George W. Craigie, Miss L. Wilson, K. E. Terry, C. H. Reese, R. L. Barton, C. E. Ackley, G. K. Singletary

INDUSTRIAL AFFILIATES—Ralph Kumler (American Cyanamid); J. W. Hemphill (Johns-Manville); F. F. Frothingham (Bird Machine Co.); F. E. Hutton (Babcock & Wilcox); N. O. Well (W. S. Tyler Co.); F. A. Soderberg (General Dyestuffs)

▶▶▶ ATLANTIC CITY'S famous boardwalk felt the tread of America's papermakers last month when the American Pulp and Paper Mill Superintendents Assocation held its annual convention at Chalfonte-Haddon Hall, June 17-20. With a registered attendance of about 550 superintendents and affiliates from all parts of the United States and Canada, the meeting combined serious business with the pleasure of the beach and boardwalk.

New president of the Association is Charles H. Reese, Nekoosa Edwards Paper Company, who takes the reins from Ollie Messner, Empire Box Company. F. F. Frothingham, Bird Machine Company, stepped down from the chairmanship of the Affiliate Group to make way for the new chairman, F. A. Soderberg, General Dyestuffs Corporation. George Craigie is secretary-treasurer, and Harry E. Weston is associate secretary-treasurer of the Association.

Over 30 technical papers were presented at sessions of the general conference and at group meetings, devoted to the following subjects: wood room

THE KEYSTONE . . . emblem of the American Pulp and Paper Mill Superintendents Association, took on a particular significance when that Association presented to the Commissioners of Fairmount Park, for the City of Philadelphia, a bronze plaque telling all who visit the Park that in 1690 William Rittenhouse there built the first paper mill in America. At that time, the town of Germantown was not far from the mill site.

Fitting ceremonies attended the dedication of the marker on June 13 prefatory to the twenty-ninth annual meeting of the Superintendents Association in Atlantic City. The plaque was unveiled by William H. Brydges, and the presentation was made officially by Fred C. Boyce. Both men are trustees of the Association; Mr. Boyce was its first president; Mr. Brydges is one of the past presidents.

In charge of the ceremonies was Harry E. Weston, associate secretary-treasurer of the Association, who originated the idea of marking the site of the Rittenhouse mill.

Attending the dedication were officials of the Superintendents Association and a number of the descendants of William Rittenhouse. This delegation included a two-year old representative of the eleventh generation. One descendant, J. Singleton Neisser III, outlined the interesting history of the family. The original mill was swept away by flood, but was rebuilt in 1702 a short distance from the original site.

This first American paper mill, therefore, is history's keystone reference to one of the nation's greatest industries. In the beginning, one papermaker built a small paper mill. Two hundred and fifty-nine years later, an Association with a membership numbering around 1500, serves that industry which has built solidly with the same confidence that inspired its pioneer.

Convenes in Atlantic City

and woods operations, coated papers, mill maintenance, fine paper and tissue, sulphite, board, kraft, power and graphic arts.

Most interesting technical development discussed was the new Erickson process for coating paper. First announced at the TAPPI Coating Conference in Grand Rapids, Michigan, in April (cf. P. I. and P. W., May, 1949 pp 184-6), this new chemical process for coating paper already has attracted wide attention. It was described by D. Robert Erickson, Kalamazoo, Michigan, and was demonstrated on a model coating machine made by John Waldron Company expressly for the process.

Highlight of the convention was the presentation of a huge birthday cake to commemorate the 80th birthday of Fred Boyce, one of the founders and the first president of the Association.

Two outstanding speakers brought messages of import. Dr. Allen A. Stockdale, staff speaker of the National Association of Manufacturers spoke at the luncheon on June 16. He stressed the need for better community relations between industry and people. At the annual banquet, New York State Senator Earl W. Brydges (son of Mr. and Mrs. William Brydges) was the principal speaker. He touched on the efforts being made in New York State to prevent subversive teaching in the schools and warned against permitting government to take over the prerogatives of private business.

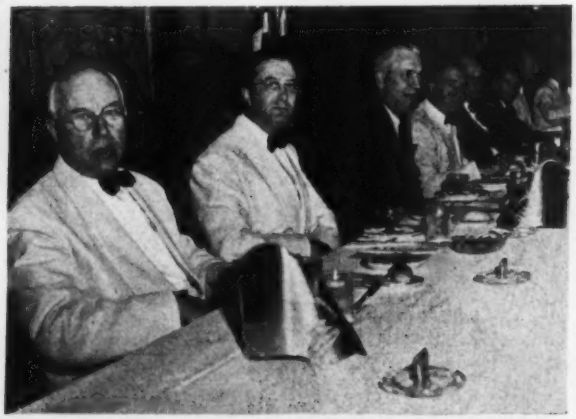
At the opening session on June 15, President Ollie Messner presented his annual report. He reviewed progress of the past year and expressed his appreciation to all those who helped carry out the program of the Association. He mentioned the erection of a bronze marker in commemoration of William Rittenhouse at the site of the first paper mill in America in what is now Fairmont Park in Philadelphia. He also told of the Award of Merit presented to the Superintendents Association from the American Trade Association Executive Oragnization for outstanding contribution to the paper industry.

Chairman of the Resolutions Committee, Harry E. Weston, read the resolutions drawn up by the committee. A number of points were emphasized in-

Charles H. Reese

Ollie W. Messner

Fred Boyce cuts eightieth birthday cake



George Craigie, Association's secretary-treas.; Douglas Jones, sec'y Canadian Tech. Section; D. B. Dick, newly-elected 5th vice president (from Canada); Gordon Singletary, newly-elected 4th vice president; Fred C. Boyce, first president of the Association; Senator Earl W. Brydges, banquet speaker; Ollie Messner, presiding president

A. M. Mausolf (Fletcher Paper Co.) & Mrs. Mausolf; Lester LaLiberte (KVP); Mrs. Brennan & R. J. Brennan (Philadelphia Felt Co.)

Luther Beighey (Hammermill); Herbert E. Karberg (Alliance Paper Mills, Canada); Frank Kreiling (Thilmany); Burke Morden (Morden Machine Co.)

Mrs. McReynolds & Reese McReynolds (Central Fibre Products); Mrs. Wade & H. R. Wade (Brunswick Pulp & Paper); Mrs. Chandler & John Chandler (Bristol Co.)

cluding the need for promoting the safety program being conducted jointly with the American Paper and Pulp Association and the importance of each and every member participating in the work of the Association.

New Officers

The complete slate of officers elected for the coming year is as follows:

President—Charles H. Reese, manager of manufacturing, Nekoosa Edwards Paper Co., Port Edwards, Wis.

First Vice President—James Fish, superintendent, Brown Co., Berlin, N.Y.

Second Vice President—Charles E. Ackley, mill superintendent, Crown Zellerbach Corp.

Third Vice President—Glen Sutton, superintendent, Sutherland Paper Co.

Fourth Vice President—Gordon K. Singletary, plant manager, Brunswick Pulp and Paper Co.

Fifth Vice President—Donald R. Dick, Howard Smith Paper Mills, Ltd., Cornwall, Ont., Canada.

Mr. Dick is the first Canadian to become an officer of the Association since 1938 when Brydone D. Millidge was president. As the Canadian representative, he promised to further efforts to improve the co-operation between the two countries.

Preceding the convention, the Board of Directors of the American Pulp and Paper Mill Superintendents Assocation held a meeting on June 14. Officers and committees reported on activities of the past year and made plans for the future. Present at this meeting were Ollie Messner, president; George Craigie, secretary-treasurer; Harry Weston, associate secretary-treasurer; Charles H. Reese, first vice president; Charles Ackley, third vice president; Fred C. Boyce, William H. Brydges, and Killey E. Terry, trustees; Raymond Bennett and Ray L. Barton, past presidents; Harold C. Leighton, representing the Miami Valley Division, and J. O. Julson, chairman of the New York Canadian Division.

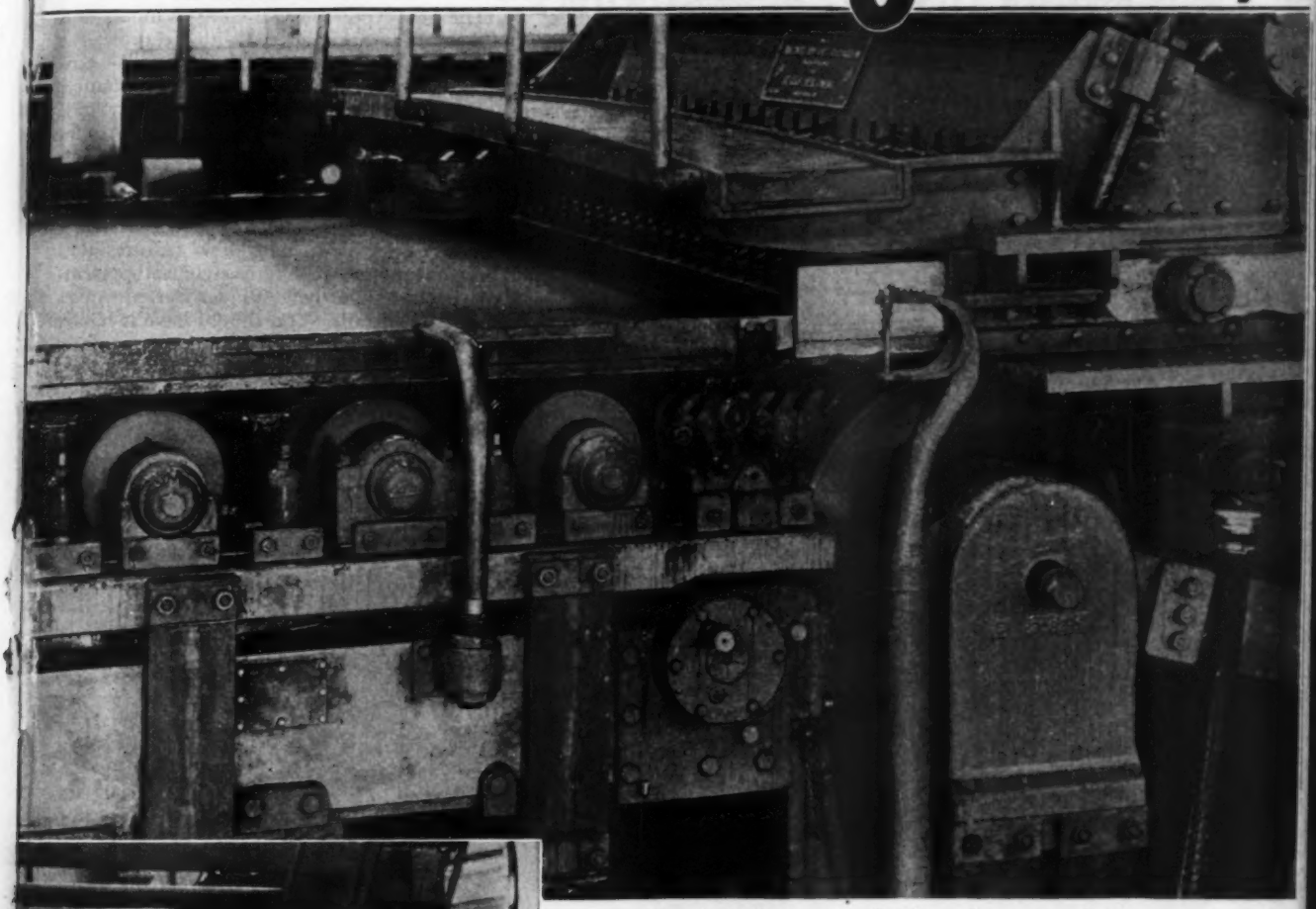
Annual dinner of the Industrial Affiliates was held June 14. Officers for the coming year are: F. A. Soderberg, General Dyestuff Corp., chairman; Allan Hyer, Bagley & Sewall Company, 1st vice chairman; H. J. Bartlett, Crane Company, 2nd vice chairman.

The following official representatives of firms associated with The American Pulp and Paper Mill Superintendents Association, Inc., as Affiliates Members make up the Industrial Affiliates Committee of the Association for 1949-1950:

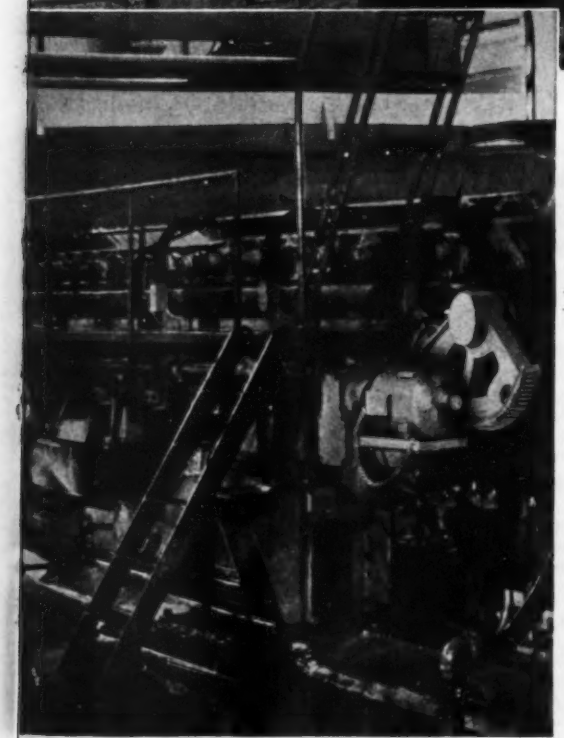
H. P. Hobart, Gulf Oil Corporation, Pittsburgh, Pa. (Chemicals, Lubricants & Petroleum products)

A. A. Harden, Corn Products Sales

PAPER · · · America's 6th Industry



New hydraulic breast roll lift on latest streamlined Puseyjones Machines totally *enclosed* in the side frames.



Old conventional breast roll lift with cumbersome, *exposed* motor operated gearing.

Now the Breast Roll Lifts Hydraulically

Here is one of the latest operating advantages of Puseyjones Machines. The breast roll is now raised and lowered from operating position by hydraulic mechanism totally enclosed in the side frames, replacing the conventional exposed gearing and motor. Check these important advantages:

(1) Eliminates danger of breakage

(2) Reduces maintenance cost

(3) More efficient wire changing

(4) Greater accessibility for operators

This new hydraulic breast roll lift is just one of the many design improvements in the new Puseyjones Machines, improvements that mean higher speeds, lower production costs and improved competitive position. Let us give you the facts.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington 99, Delaware, U.S.A.

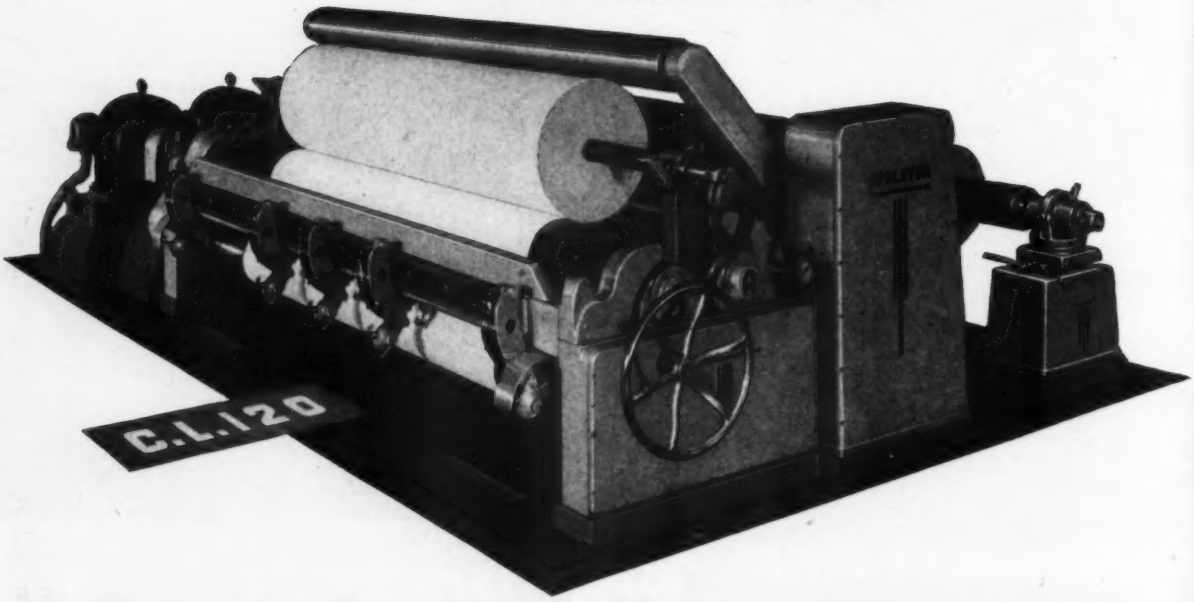
THE SIGN OF TRADE MARK SUPERIOR QUALITY

YES GO WEST

1949 Fall Meeting TAPPI, Portland, Ore.

ACCURACY-SPEED-ECONOMY IN WINDING AND SLITTING

The new Appleton C-L Class Winders and Rewinders are packed with features for winding perfect rolls at high speeds—economically. They are new in appearance. The usual superstructure and counterweights have been done away with and replaced by the new, efficient, swinging-arm riding roll, an Appleton development. Threading is easy and fast. Winding speeds, tension of the sheet and the density of the finished roll are easily controlled from the central control panel. Appleton Winders have been engineered to correct many winding problems and to produce perfectly wound rolls with greater ease. They have many new features that provide important operating advantages to effectively meet present-day accelerated production schedules. Our new Winder Bulletin gives all of the mechanical and electrical details. You should have it handy when planning your next winder or rewinder installation or replacement. Your copy will be sent upon request.



APPLETON WINDERS & REWINDERS

CLEAN CUT ROLLS OF UNIFORM DENSITY

SCORE-CUT SLITTING

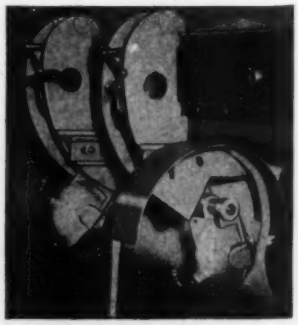
Appleton mill type Winders use the score-cut method of slitting, with an improved, demountable type, lightweight aluminum holder. Each slitter may be removed, respaced, or adjusted easily and independently. The spindle is ball-bearing mounted and removable. Knives are properly guarded.

PNEUMATIC KNIFE PRESSURE CONTROL

Cutting pressure is maintained and the knives released from contacting the platen roll—pneumatically. Uniform pressure is maintained on all units eliminating individual adjustments. Easily controlled to operating requirements.

SPHERICAL TYPE SEPARATORS

Anti-friction bearing, spherical type separators assist in spreading the slit for a full cut guaranteeing easy division of the wound roll. The plowing depth is adjustable.



PNEUMATIC KNIFE PRESSURE AND RELEASE

THE APPLETON MACHINE COMPANY • APPLETON • WISCONSIN

Eastern U. S. A. and Foreign Sales • CASTLE & OVERTON, Inc. • 630 Fifth Avenue, New York City

Co., New York, N.Y. (Clays, starches & Fillers)

F. A. Soderberg, General Dyestuff Corp., New York, N.Y. (Dyestuffs)

Allen Hyer, Bagley & Sewall Co., Watertown, N.Y. (Paper Mill Machinery)

R. K. Prince, Allis-Chalmers Manufacturing Co., Milwaukee, Wis. (Pulp Mill Machinery)

T. R. Schanner, Bowser, Inc., Fort Wayne, Ind. (Auxiliary Equipment)

A. L. Hamm, Combustion Engineering-Superheater, Inc., New York, N.Y. (Power Plant Equipment)

W. E. Buchanan, Appleton Wire Works, Inc., Appleton, Wis. (Wire and Felts)

H. J. Bartlett, Crane Co., Chicago, Ill. (Materials of Construction, Maintenance and Supplies)

H. O. Ehrisman, The Foxboro Company, Foxboro, Mass. (Control Instruments)

The appointment of one member of the Industrial Affiliates to each of the nine divisions of the Superintendents Association has been approved by the Trustees of the Association and these appointments will be made soon. The member appointed will keep in close touch with the officers of the division to which he is assigned and will cooperate in the activities and plans of the division.

The social side of the convention was not neglected. Preceding the banquet June 17 was the cocktail party given by the Industrial Affiliates. After the banquet program of speakers, Harry Hulmes, Williams-Gray Company, led community singing. This was followed by dancing.

The ladies program was under the direction of the following committee: Mrs. Ollie W. Messner, chairman; Mrs. Charles H. Reese; Mrs. James Fish; Mrs. Charles E. Ackley; Mrs. Glen Sutton; Mrs. Gordon Singletary; and Mrs. Frank Frothingham. The program included activities on the beach and boardwalk as well as a quiz contest, bingo and card games and several moving pictures.

Technical papers were given at the general conference and at group meetings. Those given before the whole group were as follows:

Jordan Plug Pressure Control and Recording System, Bruno E. Provost, Emerson Mfg. Co., Lawrence, Mass.

Cost Accounting as an Operating Tool, C. E. Patch, Morton C. Tuttle Co., Boston, Mass.

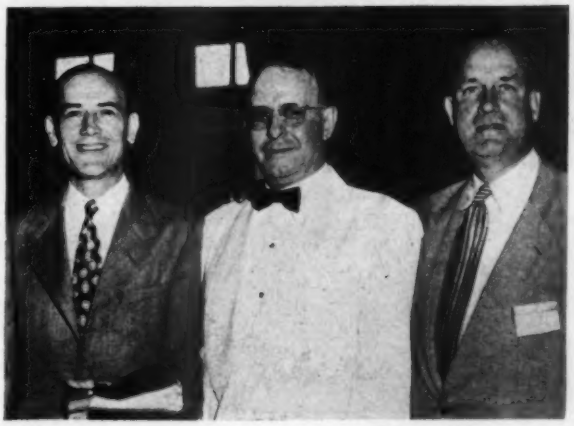
Materials Handling in Pulp & Paper Mill, Mathew W. Potts, consultant, New Rochelle, N.Y.

Supply, Demand, Money and Prices, Walter Fried, consulting engineer, Huntington, N.Y.

Harry Hulmes (Williams-Gray Co.) hits a high note leading singfest

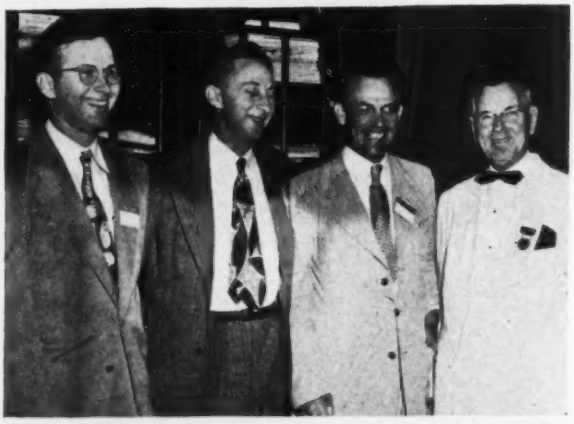
J. W. Youngchild (I. P. Co.); Radford H. Russell (Everett P. & P.); L. E. Smith (Cons. W. P. & P. Co.)

Richard Tooling (Raybestos-Manhattan); Wm. Burke (General Dyestuffs); Robert Pattison (Cellulose Fibres, Inc.)



A. A. Nyitray (Eastwood-Nealley); Charles Ackley (C-Z), advanced to 2nd vice president of Association; Donald Hall (Eastwood-Nealley)

Harry Williamson (consultant) & Mrs. Williamson; Phillip Goldsmith (Pusey&Jones); Harry Weston, associate secretary-treas. of the Association



Geo. Whiteside and Thomas Digby (Container Corp., Fernandina); John Natwick (Bauer Bros.); Wm. Brydges, Association past president

Standing: Senator Earl W. Brydges, banquet speaker; Sidney Sobel (Sobel Paper Co.). Seated: K. H. Jones (J. O. Ross); Mrs. Sidney Sobel; Geo. Cash (J. O. Ross); Mrs. Earl W. Brydges

Charles Reese; Gordon Singletary; Mrs. Charles Reese; Ollie Messner; Mrs. Messner; John O'Brien; Mrs. Charles Ackley & Mr. Ackley; Mrs. D. R. Dick & Mr. Dick

Group Meetings

Wood Room and Woods Operations

Chairman—James Fish, Brown Co., Berlin, N.H.
Co-Chairman—C. P. Robinson, Heppenstall Co., New York, N.Y.

Current Issues in Chipper Design, C. R. Wardwell, Carthage Machine Co., Carthage, N.Y.

Latest Developments in the Production of Pulpwood, W. S. Bromley, Forest Engineer, American Pulpwood Association, New York, N.Y.

King Spruce, film loaned by Brown Co., Berlin, N.H.

Coated Papers

Chairman—Brainerd E. Sooy, The Gardner Board and Carton Co., Middletown, O.
Co-Chairman—A. C. Dreshfield, Consulting Chemical Engineer, LaGrange, Ill.
Panel Dicussion—Machine Coating Binders, moderator, A. C. Dreshfield, Consulting Engineer, LaGrange, Ill.

Casein, Harris O. Ware, Hercules Powder Co., Inc., Wilmington, Dela.

Starch (cooked), Dr. J. E. Killinger, Penick & Ford, Ltd., Cedar Rapids, Iowa.

Starch (enzymic), W. L. Craig, R. T. Vanderbilt Co., New York, N.Y.

Alpha-Protein, Walter M. Bain, The Glidden Co., Chicago, Ill.

Latex, E. K. Stilbert, Dow Chemical Co., Midland, Mich.

A New Coating Process Involving Ion Exchange, D. R. Erickson, Consulting Chemist, Graphic Arts Laboratories, Kalamazoo, Mich.

The Place and Future of Machine Coating in the Industry, B. R. Newcomb, John Waldron Corp., New Brunswick, N.J.

Mill Maintenance

Chairman—Gordon K. Singletary, Brunswick Pulp & Paper Co., Brunswick, Ga.
Co-Chairman—F. H. Cole, Walworth Co., Inc., New York, N.Y.

Power Plant Maintenance, William P. Jordan, Ecusta Paper Corp., Pisgah Forest, N.C.

Maintenance of Anti-Friction Bearings in Paper Mills, George H. Spencer, Pulp and Paper Div., The Torrington Co., South Bend, Ind.

Maintenance of High-Speed Paper Machines, C. P. Spalding, Beloit Iron Work, Beloit, Wis.

Fine Paper and Tissue

Joint Chairmen—J. O. Julson, B. F. D. Div., Diamond Match Co., Plattsburg, N.Y. (Tissue); James Rogers, II, J. & J. Rogers Co., Au Sable Forks, N.Y. (Fine Paper)
Co-Chairman—C. H. Vickery, E. D. Jones & Sons Co., Pittsfield, Mass.

Ramblings of a Tissue Mill Superintendent, J. O. Julson, B. F. D. Div., The Diamond Match Co., Plattsburg, N.Y.

Modern Winders & Rewinders, sound film.

The Modern Supercalendar, E. E. Thomas, Appleton Machine Co., Appleton, Wis.

Modern High Speed Supercalendering, silent film. Film presentations made by Appleton Machine Co., Appleton, Wis.

Electroplating for Paper Machiner, C. H. Belvin, Chromium Corp. of America, New York, N.Y.

Production of Mold Resistant Paper and Paperboard, William D. Stitt, Buckman Laboratories, Inc., Memphis, Tenn. (Presented by Title)

Sulphite

Chairman—Donald A. Hunter, B. F. D. Div., Diamond Match Co., Ogdensburg, N.Y.
Co-Chairman—Vance P. Edwardes, International Paper Co., Palmer, N.Y.
Panel Discussion—Trends in Sulphite Pulping, moderator, Vance P. Edwardes, International Paper Co., Palmer, N.Y.

Panel Members:

H. Karberg, Alliance Paper Mills, Merritton, Ont., Canada.

E. F. Tucker, Stebbins Engr. & Mfg. Co., Watertown, N.Y.

Roy Davis, Detroit Sulphite Pulp & Paper Co., Detroit, Mich.

(Turn to page 451)

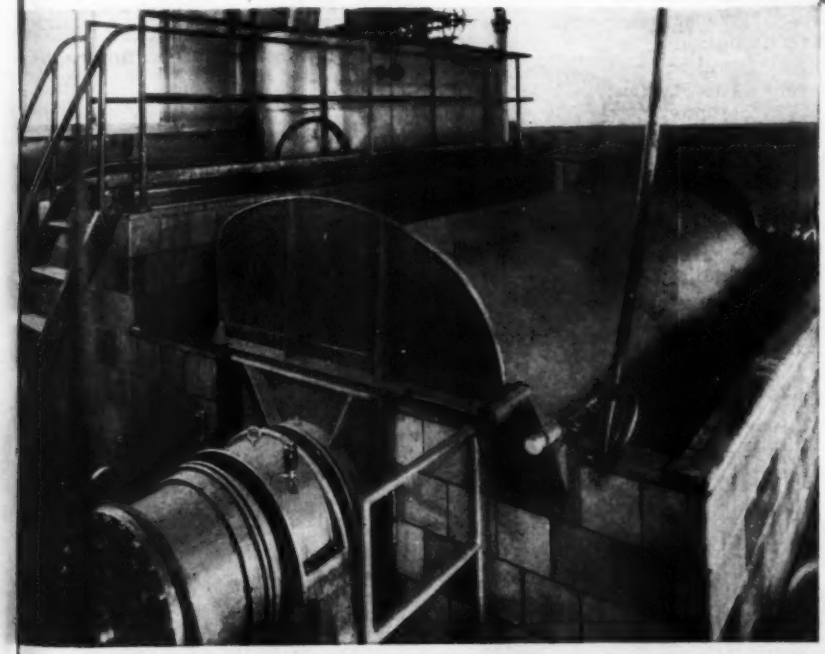
OLIVER Rubber Covered SAVEALL

note the TILE vat!

Tile combines exceptionally low maintenance, non-contaminating contact surfaces and great durability. Life is mill-life. Physical damage is easily repaired. No exterior painting is required. Having furnished all types of vats for Savealls over a period of many years we know their relative values. We recommend TILE when conditions call for corrosion prevention and permit permanency of installation. Tile is used at the Tacoma, Washington, mill of the St. Regis Paper Company, where this Saveall is installed.

The Oliver Saveall of today represents the experience of more than twenty-five years of service to the paper industry during which time several hundred of these highly efficient fibre recovery units have been installed, including many during the past year or two. With today's units, we can offer a choice of three distinctly different dischargers, thus assuring complete and clean discharge regardless of the nature of stock handled. Where anti-corrosion is imperative, we can provide rubber protected surfaces with stainless steel wire decks and stainless outlet pipes as at St. Regis. Or you can get a combination of wood and cast iron.

In short, we can provide just the Saveall you need to economically and properly recover the values in your mill.



. . . A Few OLIVER SAVEALL Features

- Recent installations are for handling: kraft, sulphite, old paper, tissue furnishes
- Handles wet breaks as well as white water without separate system
- Produces consistently clear filtrate, reusable on showers
- Has shown maintenance and labor costs as low as 3½ cents per ton

OLIVER UNITED FILTERS INC.

New York 18, N. Y.
33 West 42nd Street

Chicago 1, Ill.
221 N. LaSalle Street

Western Sales Division:
Oakland 1, Calif.
2900 Glascock Street
San Francisco 11, California

Sales & Manufacturing Representative:
E. Long Limited, Orillia, Ont., Canada

Factories: **Oakland, Calif. • Hazleton, Pa. • Orillia, Ont., Canada • Melbourne, Australia**

New 105-inch corrugator consists of a single facer (shown at the left) and double-facer (back, right). Machine can operate up to 500 fpm

New Corrugator at Eddy Paper Plant Speeds Up Production

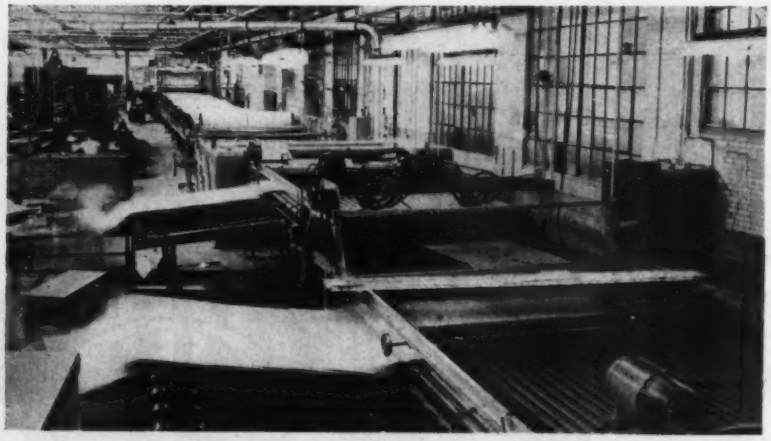
▶▶▶ THE NEW MACHINE for producing corrugated paper at the Three Rivers (Mich.) plant of the Eddy Paper Corporation, is now in continuous operation.

This machine, which is claimed to be the second largest machine for producing corrugated paper in the United States, and the largest in the state of Michigan, is approximately 300 ft. long. It turns out a sheet 105 inches wide—the machine at the Eddy plant in Delair, New Jersey, produces a sheet 115 inches wide.

Although plans for the new machine were in formation several years ago, it was not until last year that the plans were put into work. This came about when the old 82-inch machine at Three Rivers was dismantled and shipped to the new Eddy box shop at Belleville, Illinois.

The new machine is a product of Samuel M. Langston Company. It is completely automatic; every movement is governed by remote electrical control, except the manual operation of placing the rolls of feeder materials. A crew of nine men, in charge of Elmer Grimes, foreman of the department, is handling the operation. According to George C. Radke, general superintendent, it will be another 60 to 90 days before production figures are available. It was stated, however, that much wider paper was being turned out at a speed from 60 to 75 per cent greater than on the old machine.

George Radke



After being glued, the double-faced corrugated is heated, then cooled between canvas belts before being slit, scored and cut

Trade Winds . . . . . .

FELLOWSHIP GRANTS ARE RENEWED BY KIMBERLY-CLARK

Grants for research fellowships at Massachusetts Institute of Technology, University of Michigan, and the University of Wisconsin have been renewed by the Kimberly-Clark Corporation, Neenah, Wisconsin, and another has been established at Purdue University, Lafayette, Indiana.

Kimberly-Clark's fellowship program, which was established in 1946, is planned to implement graduate studies on subjects of interest to the pulp and paper industry, and to encourage research work in the sciences. The fields of work designated are: chemical engineering, organic chemistry, physics, and forestry. Each school concerned selects the specific subjects of study and the student who is to receive the fellowship. Although the corporation maintains a liaison with the schools and is generally familiar with the work being accomplished, it has no special claim on results and findings, which are published as the school may determine.

The committee which administers the fellowship program is under the chairmanship of H. A. Rothchild, technical director of the company, and includes R. W. Lyons, assistant vice president and woodlands manager, and W. H. Swanson, director of manufacturing.

▼

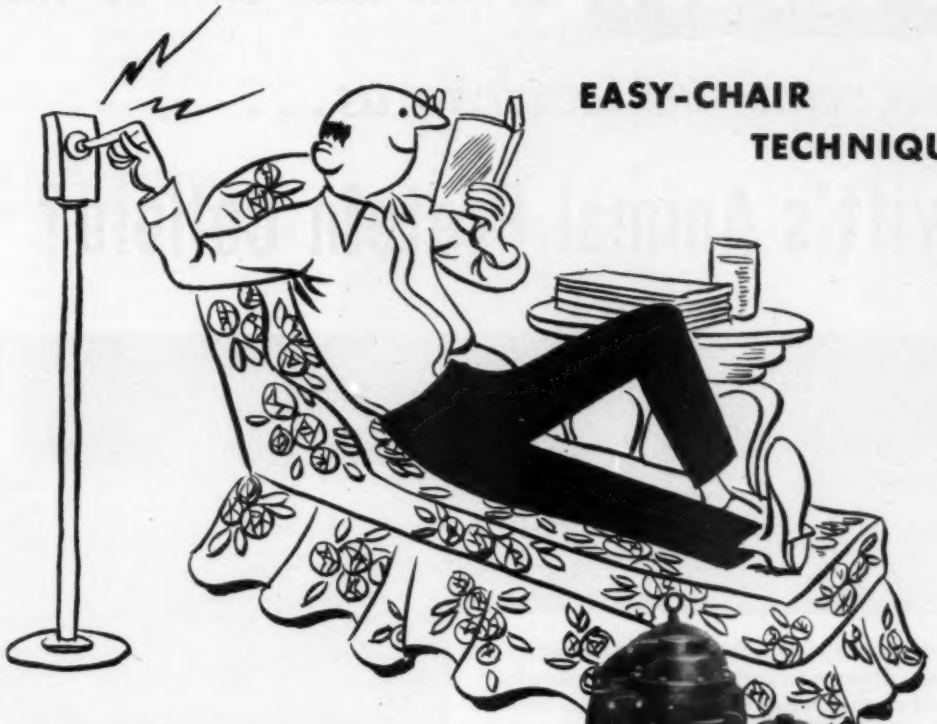
IMPORT NOTES

That Germany will soon be exporting various paper products to the United States, chiefly in the specialty field is evidenced, according to Warren B. Bullock, Manager of the Import Committee of the American Paper Industry, by an importation of paper napkins decoratively printed in the United States zone of Germany. The napkins were claimed by the importer to be dutiable as paper cut into shape, but were held by Customs officials to be dutiable at the higher rate for manufacturers of paper. The same action has been taken on imports of napkins from Norway and the United Kingdom.

Other cases involving imported papers have been acted upon by Customs officials. Toilet paper in rolls was held to have been undervalued. Cream manila paper imported into Tennessee from Canada was claimed to be dutiable as printing paper, but held for duty at the higher rate for wrapping paper.

The United States Customs Court has held that a dozen shipments of aluminum foil paper were dutiable at the actual sale price, even though that price was much lower than the usual quota-

EASY-CHAIR TECHNIQUE



YESTERDAY somebody had to climb a ladder, pretzel himself around a corner or slither along a pipe, to yank the handle of some valve. In some mills they still do it that way.

The "new look" is the push button way—with Shartle *motorized* rotary and slide valves. Just press the button and the job is done. Easy-chair technique.

Shartle rotary and slide valves are so built that they cannot stick—no place for stock to lodge, pack and dry. We'll gladly forward a drawing to prove the point or tell you where you can see some of them operating.

ROTARY AND SLIDE TYPES in all required sizes. Rotaries — straight-way, three-way and four-way; lever, chain or remote control operation; all-cast body and rotor, or rotors of bronze or stainless steel.

CONTACT

SHARTLE BROS. MACHINE CO., Middletown, Ohio

DILTS MACHINE WORKS, FULTON, NEW YORK

Divisions of

THE BLACK-CLAWSON COMPANY, HAMILTON, OHIO

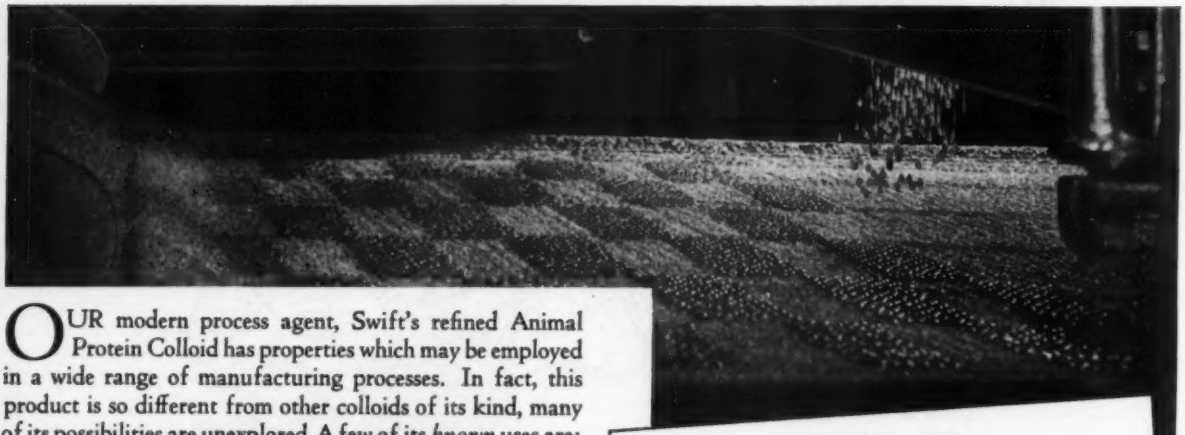
Western Sales Office: Mayer Building, Portland, Oregon

Associate: ALEXANDER FLECK LIMITED, Ottawa, Canada

Subsidiary: B-C International, Ltd., 16 Catherine Place, Victoria, London S.W.1, England

You tell us! *What uses can be made of a process agent as clean as...*

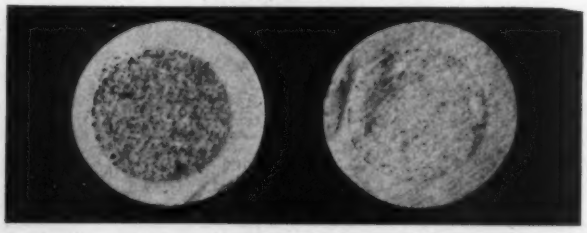
Swift's Animal Protein Colloid*?



OUR modern process agent, Swift's refined Animal Protein Colloid has properties which may be employed in a wide range of manufacturing processes. In fact, this product is so different from other colloids of its kind, many of its possibilities are unexplored. A few of its *known* uses are:

1. An emulsifier
2. A flotation agent
3. A gel structure
4. A settling agent
5. A protective coating
6. A sizing agent
7. A carrier of pigments
8. An impregnating agent
9. A base for pigments
10. An oilproofing agent
11. A flocculating agent
12. A clarifying agent
13. A filtering agent
14. A stiffening agent
15. A mordant
16. An adhesive

...but there may be many *others* of equal value!



Here a filter test indicates the relative cleanliness of this new process agent. Left: Ordinary commercial grade bone glue. Right: Swift's Animal Protein Colloid.

Try it for yourself. We invite you to test the possibilities of Swift's Animal Protein Colloid. It may meet your present requirements or help you to develop new products or more efficient processes.

For further information about Swift's Animal Protein Colloid write: →

*Commercially high quality bone glue

What is this modern process agent?

Swift's Animal Protein Colloid is made by an exclusive Swift process. This process makes possible the production of high quality protein colloid of unusual uniformity in particle size and composition.

In a spotless modern plant, protein liquor falls on a bed of dry finished product (see photograph) which adheres evenly to the droplets. By continuous schedule, under precise control every second, these droplets are dried, milled and screened.

During this almost automatic operation, the product has no contact with materials which could contaminate it with foreign substances.

As a result, Swift's Animal Protein Colloid is a clean, finely ground powder (light amber in color) which goes into solution rapidly.

Swift & Company

Adhesive Products Department

4123 Packers Avenue

Chicago 9, Illinois

tions in the country of origin. The Court based its decision on the ground that the foreign market was under cartel control as to prices and distribution, the cartel by this procedure being able to escape payment of duty on the real foreign price. The shipments were made by Germany prior to World War II, but have been before the Customs Court since that time.

▼

SCOTT BUYS HOBOKEN PROPERTY NOW LEASED BY CUT-RITE DIVISION

The land and plant building at Hoboken, New Jersey, occupied under lease by the Cut-Rite Division of Scott Paper Company (Chester, Pennsylvania) has been purchased by the company, pursuant to the exercise of an option contained in the lease.

Scott Paper has also entered into a contract to purchase from Harbison-Walker Refractories Company approximately 8½ acres adjacent to its property in Chester. The buildings on the property are of little or no value, and most of them will ultimately be removed, but the land and railroad sidings offer many advantages for receiving, shipping and storage.

▼

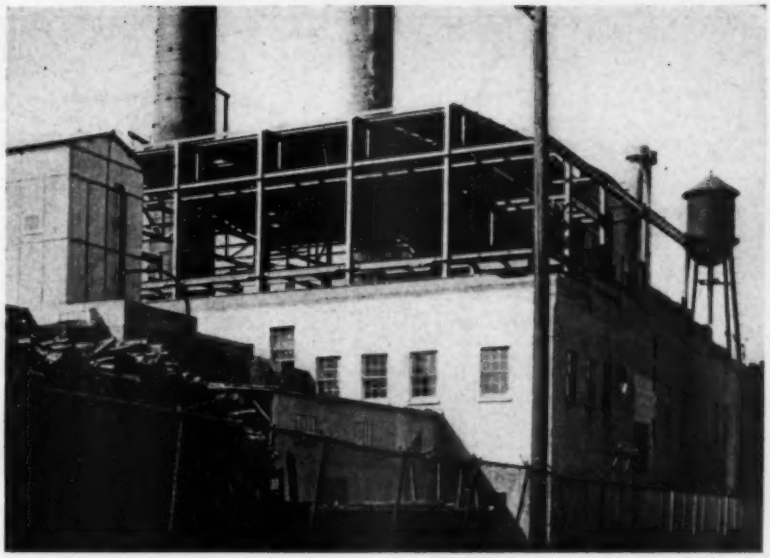
▶▶▶ THE NEW $100,000 plant at Flint, Michigan, of the Ottawa River Paper Company (Toledo, Ohio) is ready to go into production (cf. P.I. and P.W., March, 1949). Philip LeBoutillier, Jr., president of the company, said the plant is equipped to manufacture all kinds of corrugated containers, liners, pads and partitions, plain or printed in two colors, special industrial shipping containers, and expendable paper pallets.

▼

300 VETS ARE TRAINEES IN THE PAPER AND PAPER GOODS PRODUCTION FIELD

Nearly 300 World War II veterans are training on-the-job under the G. I. Bill and Public Law 16 for occupations in the production of paper and paper goods. This was disclosed in a Veterans Administration study of the principal courses and employment objectives of 2,535,385 veterans enrolled under both laws, in schools and job training establishments on December 1, 1948.

Of the 290 trainees in the paper and paper goods field, 223 were enrolled in job training establishments under the G. I. Bill, and the remaining 67—all disabled veterans—were in training under Public Law 16, an act that provides vocational rehabilitation for those with service-connected disabilities.



***PROGRESS OF STRUCTURAL STEEL WORK** on building that will house the new continuous brown stock washing system to be installed at Nekoosa (Wis.) kraft mill of Nekoosa-Edwards Paper Co.*

Continuous Brown Stock Washing System for Nepco's Kraft Mill

▶▶▶ AT THE KRAFT MILL of Nekoosa-Edwards Paper Company, Nekoosa, Wisconsin, construction is under way for the installation of a continuous brown stock washing system to replace the present diffuser system of washing.

The old recovery building where the equipment will be housed is being raised approximately 30 feet to accommodate the installation.

This new system will make possible a more uniformly washed pulp which in turn will result in a more uniform bleached product. Also, it will allow for increased capacity of the kraft pulp mill due to the increased capacity and speed of the washing system. Among other advantages of the new system are a saving in soda, improved screening, and a better use of whitewater in the wet room.

When the installation is completed, it is expected that the capacity of the kraft mill will reach approximately 200 tons daily, which is one-third greater than present capacity.

Equipment in the new system will consist chiefly of vibratory knotters, rotary vacuum washers, a 25-ton blow tank, several 30-ft diameter liquor tanks, foam breakers, and the necessary auxiliary pumps and piping. The vibratory knotters are intended to eliminate knots ahead of washing. The rotary vacuum washers will measure 8 x 16 feet and will be three in number. They are to be operated continuously in series.

With the installation of the new brown stock washing system, three old diffuser rings from the present washing system will be removed. The elimination of the diffusers will provide additional digester room for future expansion of pulp mill capacity. It is hoped that the new system will be in operation by 1950.

▼

▶▶▶ A NEW CONCERN, the New England Forest Products Company, has taken occupancy of the property of the Collins Manufacturing Company, North Wilbraham, Massachusetts, under a lease arrangement and expects to start manufacture of paper in the fall. Richard A. Robie of Boston, head of a New England Driv-Ur-Self auto system is president of the new company. The lease is for ten years with an option to buy.

▼

I.P. COMPANY TO ERECT $250,000 ADDITION TO NO. TONAWANDA PLANT

A $250,000 addition to its plant on Tonawanda Island in North Tonawanda, New York, will be erected by the International Paper Company. Work will start within the next two months. The addition will be a two-story structure of steel and celocrete blocks, 90 x 150 ft.

Plant manager J. W. Youngchild said the addition will be made to the factory's paper-finishing department for the production of fine printing paper.

***A GROUP OF VISITORS** numbering 75 made a tour of Champion's Houston Division Mill at Pasadena, Texas, to see the initial production of fine grade white papers made on the recently installed papermaking machine*

Champion Celebrates First Texas Production of Fine White Papers

▶▶▶ BRIEF CEREMONIES on May 4, with President Reuben B. Robertson presiding marked the first Texas production of fine white papers for printing and converting purposes, at the Houston Division of The Champion Paper and Fibre Company.

Seventy-five guests attended the program, toured the Champion site, at Pasadena, on the Houston Ship Channel, and visited with Champion officials. The group afterward attended a dinner at the Houston Country Club.

The block-long machine, which began operation, was transported to Texas on 41 freight and flat cars from its former location at Champion's Hamilton, Ohio, plant.

President Robertson told the guests that, "Champion will now manufacture the first fine papers for printing and converting purposes in Texas, and will make the first 'home' use of Texas pulpwood for quality paper stocks."

Prior to the multi-million dollar expansion, Champion manufactured only bleached pulp and *Life* magazine body stock at its Houston plant.

Guests attending the opening ceremonies met these Champion officials: R. B. Robertson, Jr., executive vice president; Dwight Thomson, vice president; Herbert Suter, Jr., general sales manager, and W. R. Crute, Houston Division manager.

WESTVACO MAPS MILLION DOLLAR IMPROVEMENT PLAN AT TYRONE PLANT

Plans to strengthen the economic position of the Tyrone (Pa.) plant of the West Virginia Pulp and Paper Company to meet tightening competition in the industry were announced recently by company officials.

As one phase of its plans, the company has authorized five major improvement projects, costing well over $1,000,000. Officials expect these improvements, together with an adequate supply of suitable pulpwood within economic reach of the mill, to bring the plant more nearly abreast of competition in the paper field and to provide a variety of economic and social benefits for employees and the community.

At the same time, the company will shut down the 30-year-old carbon plant at Tyrone, which in recent years has proved to be an outmoded operation. The carbon plant has been losing money, it was said, because it is incapable of competing with more modern carbon-producing installations.

Improvements approved for Tyrone include the addition of a machine coating unit to one of the mill's four machines, at a cost of more than $600,000, improvements to buildings housing the plant's paper machines, to cost about $200,000, construction of a large, mechanically cleaned settling basin, to be built exclusively for stream improvement purposes, $150,000, installation of a dust-collecting apparatus which promises to relieve the community dirt situation considerably, $40,000, and repair of a reservoir which provides the plant with water, $25,000.

The improvements, some of which have been impending for several years, have interrupted operations at the plant for the first time in about ten years, company officials said. It is hoped that normal operations will be resumed within a few weeks.

The shutdown of the carbon plant will not affect the Nuchar Research Laboratory, center of the company's carbon research activities, which employs fifteen chemists and technicians. The company's other two carbon plants at Covington, Virginia, and Luke, Maryland, will continue normal operations.

▼

ANOTHER MILL NOW BEING PLANNED FOR ALBERTA, CAN.

Following news of Alberta's first pulp and paper mill (cf. P.I. and P.W. May, 1949) comes the report that another project is developing—a $10,000,000 kraft and bleached pulp mill, planned by Alberta Pulp Mills.

This announcement, made by H. M. Simpson, vice president of Cellulose Engineers, Inc., Seattle, Washington, states that Red Deer, Alberta, has been chosen as the site of the proposed mill. With plans in the formative stage, it is considered that actual construction will start possibly within another year or two. Just now, construction cost of the mill is set at approximately $9,000,000 with $1,000,000 for working capital.

▼

R. O. SWEEZEY READY TO PRESENT EDMONTON MILL PLANS TO GOVERNMENT

R. O. Sweezey, Montreal financier, who with Eastern financial associates is considering construction of a 200-tons-a-day newsprint and pulp mill near Edmonton, Alberta, (P.I. & P.W., May, 1949, page 188) will visit the provincial capital again soon to lay his plans before the government.

During his recent visit, Mr. Sweezey

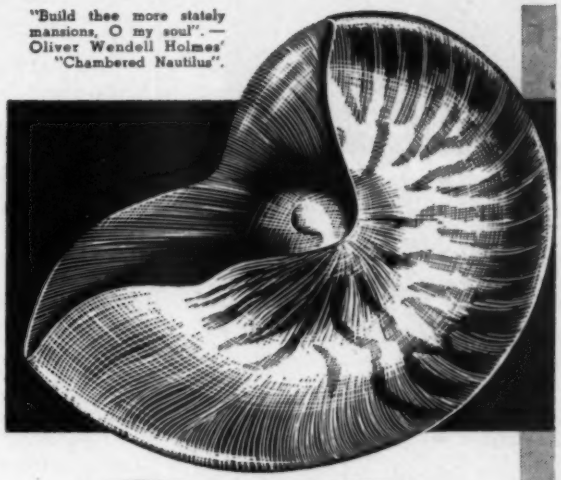
GROWTH

It won't be long, little fellow, till you'll be wishing you were young again.

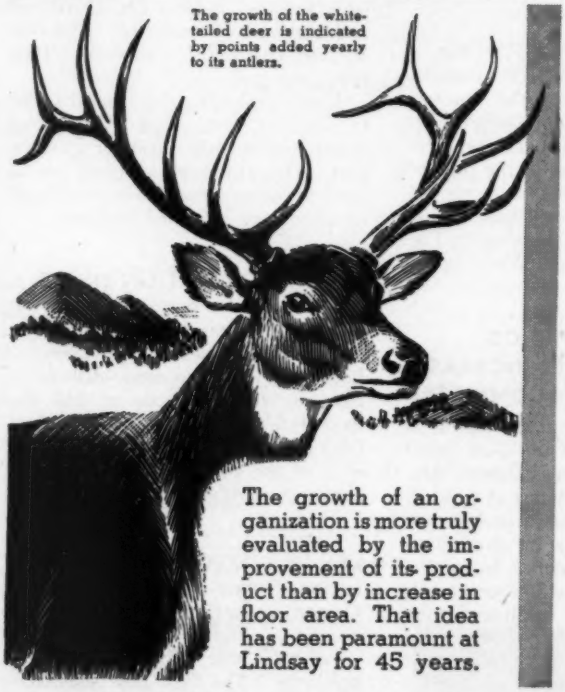
"Time is the measure of a successful business enterprise, as money is the measure of wares"*. Lindsay hopes to serve the manufacturers of paper faithfully for many years more.

*Adapted from Sir Francis Bacon

"Build thee more stately mansions, O my soul". — Oliver Wendell Holmes' "Chambered Nautilus".



The only worthy industrial expansion is that which is founded upon the quality of the product manufactured. That thought has been behind the growth which has been enjoyed by Lindsay for 45 years.



The growth of the white-tailed deer is indicated by points added yearly to its antlers.

The growth of an organization is more truly evaluated by the improvement of its product than by increase in floor area. That idea has been paramount at Lindsay for 45 years.

The tree rings show that this Douglas fir started its career in 1073 and was felled in 1260.

Sound growth in an industrial organization, like that of a tree, must be accomplished from the inside out. That principle has been a cardinal policy at Lindsay for 45 years.

The LINDSAY WIRE WEAVING Company 14001-14299 Aspinwall Avenue Cleveland 10, Ohio

It is a fine thing to propose wonderful theoretical ideas about well water systems and vertical turbine pumps, but Layne never ventures away from everyday basic ideas. That fact may account for the world-wide use and popularity of Layne Well Water producing equipment. It certainly accounts for such things as high efficiency, rugged construction and reliability of operation. So until the impossible happens, you can be sure that Layne engineers and designers are sticking to basic ideas that always pay off in satisfaction to the user.

Of course Layne Well Water Systems are as modern as tomorrow, in that they are properly designed and constructed of the finest tested and proved materials. Furthermore they are as accurate in precision building as modern tooling and experienced workmanship can make them.

In buying a well water system, you naturally want a full dollar's worth of value. You want a maximum amount of water at a minimum of daily operation cost—plus freedom from breakdown and repair expense. Those requirements just about sum up exactly what you get when you choose a Layne Well Water System. For further information, catalogs, bulletins, etc., address Layne & Bowler, Inc., Memphis 8, Tenn.

LAYNE
WELL WATER SYSTEMS

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Pacific, Inc., Seattle, Wash. * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Minnesota Co., Minneapolis, Minn. * International Water Corporation, Pittsburgh, Pa. * International Water Supply, Ltd., London, Ont., Can. * Layne-Hispano Americana, S. A., Mexico, D. F.

discussed four possible sites. Capital cost has been put at over $14,000,000, and employment during full operation will be about 350. Lands and Forests Deputy Minister John Harvie recently received a letter from Mr. Sweezey saying his group is now prepared to present a plan.

▼

CONTAINER CORP. LEASES PLANT IN PORTLAND, ORE.

Negotiations were started in June by the Container Corporation of America to take over the Columbia Paper Products Company plant in Portland, Oregon. The announcement was made by Joe O'Reilly, owner of the Portland concern.

The Container Corporation will lease the plant (which produces corrugated and folding boxes) and operate it as its Columbia Paper Products Division. Office manager for Container will be Dan P. Keane. No change in the personnel of the Portland plant, which employs about 38 people, is contemplated at the present time.

Officials of the Container Corporation asserted that industrial growth in the Northwest prompted them to make this initial entry into the Portland field. Mr. Keane predicted that operations will be expanded later.

▼

▶▶▶ WORK HAS BEGUN on a half-million dollar, two-story structure at Palatka, Florida, for the Hudson Pulp and Paper Corporation, which Vice President Anton Lund of New York said would serve for the present as a warehouse. Room is being set aside, however, for installation of machinery which will be automatic. The new building will have 100,000 sq. ft.

▼

GULF STATES PAPER CO. PRODUCTION WILL INCREASE WITH EXPANSION COMPLETED

An expansion program which is nearing completion at the Gulf States Paper Corporation, Tuscaloosa, Alabama, will increase production of kraft paper from 200 to more than 350 tons daily. The increase in production equipment was undertaken to meet a growing demand for bags, counter rolls and wrapping paper. Facilities for the manufacture of high quality white and light-colored papers have also been added.

The expansion, carried out without any interruption in current production by The H. K. Ferguson Company, industrial engineers and builders, included the installation of a new high-speed paper machine and construction of a reinforced concrete building to house it; enlargement of the stock preparation and finishing room; an addition to the bag factory; and installation of a hydraulic elevator for more efficient handling of materials. Other auxiliary facilities were added wherever required by the increase in production. Pulp preparation equipment of larger capacity was installed, another recovery furnace was added, and the bleaching process was revised and lengthened to produce pulp of uniform high white color at a minimum chemical cost.

A new locker building has been erected for the employees' comfort which includes modern showers and radiant heating in the floor, supplemented by a forced hot air system and special ventilation during the summer months.

▼

FOURDRINIER SECTION RECENTLY INSTALLED AT MANISTIQUE P&P CO.

A new fourdrinier section was installed the week of July 4 at the Manistique Pulp and Paper Company, Manistique, Michigan. The new section has an improved breast roll running in antifriction bearings. The table rolls are constructed of aluminum with plastic covering and can be removed without lifting the slice, marking an improvement over the old rolls which were recessed behind the guard rail and could not be removed. The new rolls are balanced for a speed of 1000 fpm.

A new shake has also been installed to allow a greater variety of shaking length and to meet consumer specification. The rails and supports are of modern construction to withstand higher speeds and increased shaking.

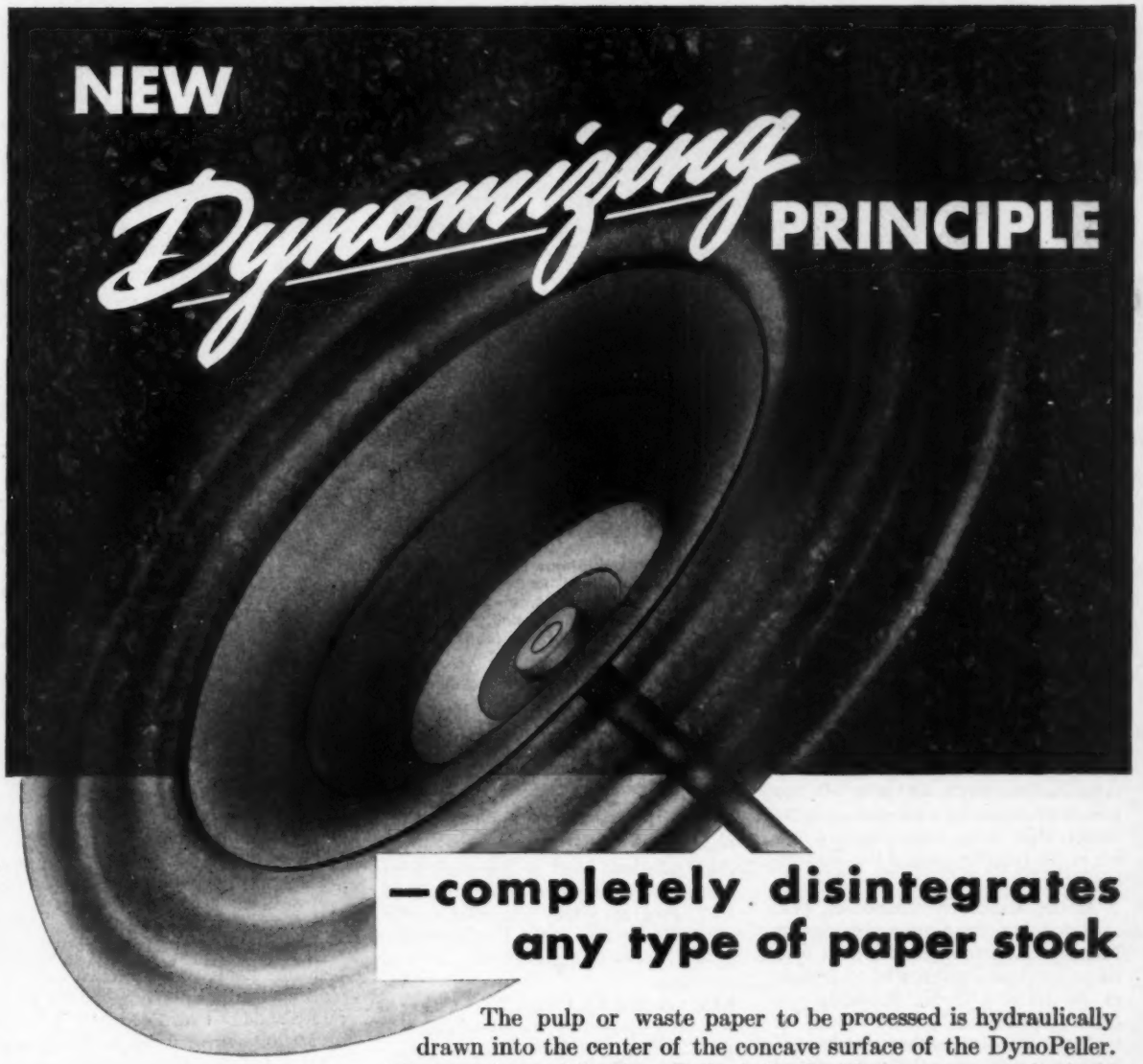
▼

▶▶▶ CONSTRUCTION OF a $12,000,000 wood pulp manufacturing plant at Lewiston, Idaho, is being considered by Potlatch Forest, Inc., of Lewiston. The proposed mill would have an initial capacity of 230 tons daily and would employ 300 workers, Otto H. Leuschel, acting general manager of the company, who made the announcement, said.

▼

▶▶▶ INCORPORATION of the Perfection Twine Company, Portland, Oregon, under the name of Portco Corporation, effective immediately, was announced June 2 by Howard Wall, president. The firm, now celebrating its 20th anniversary, produces paper products, twines, and bags. It has manufacturing operations at Camas, Washington, and offices in Portland. Wall also announced the appointment of Alport Associates, Portland, as public relations and advertising consultants.

NEW *Dynomizing* PRINCIPLE



—completely disintegrates any type of paper stock

The pulp or waste paper to be processed is hydraulically drawn into the center of the concave surface of the DynoPeller. The periphery of the DynoPeller is lined with numerous rough pieces of hardened tungsten carbide. Centrifugal force forces the stock over this roughened surface where the dynomizing action takes place in the treatment of the stock.

The stock is completely disintegrated—being reduced to its original fibre length—each individual fibre being completely separated from its neighbor.

Send for additional information.

The DynoPulper

is equipped with two DynoPellers and is primarily used in a batch operation. A bale may be charged at one time. This machine is also available in laboratory size.

The QuatroPulper

is also primarily used in batch operations. It is equipped with four DynoPellers and will handle large volumes.

The DynoChest

is equipped with one DynoPeller and will process broke or slush stock. It is used as a storage chest while completing the defiberization of stock.

The DynoFiner

is equipped with either four or six small DynoPellers. It is used in a continuous operation and completely separates fibre bundles from slush stock.

RICE BARTON *Research Corporation*

WORCESTER 1, MASS.

MICHIGAN JOINS TREE FARM SYSTEM—Gov. G. Mennon Williams (right) presents a Tree Farm Certificate to A. J. Erickson, manager of land and lumber department of Cleveland-Cliffs Iron Co. P. J. Hoffmaster, director of the Michigan Department of Conservation (left), and Sydney Ferguson, chairman of the board, The Mead Corporation and president American Forest Products Industries, looks on

GOVERNOR AND PAPER MILL MEN SPEAK AT FIRST TREE FARM DEDICATION IN MICH.

The dedication of Michigan's first certified tree farms on June 10 was hailed by public officials and industry leaders alike as the beginning of a new era in the forest history of the Wolverine state.

At the dedication ceremonies, held at a logging camp near the city of Munising, Governor G. Mennen Williams presented certificates to owners of 18 different Upper Peninsula tree farms representing 619,956 acres of timberland. Among the recipients of certificates were the following pulp and paper mills: Escanaba Paper Company, Escanaba; Manistique Pulp and Paper Company, Manistique; National Container Corporation, Ontonagon; and Northern Paper Mills, Amasa.

Michigan is the 24th state to join the Tree Farm program, encouraged nationally by American Forest Products Industries, Inc., Washington, D. C. The state's Tree Farm program is sponsored jointly by the Michigan Forest Industries and the Michigan Department of Conservation. Later this year, the sponsors plan to dedicate 86 additional Tree Farms located in the state's Lower Peninsula region.

Following the dedicatory address given by Governor Williams, several other speakers were introduced including the following paper mill officials: Bruce Buell, forester for the Northern Paper Mills, Green Bay, Wisconsin; Charles Sage, vice president of Kimberly-Clark Corporation, Neenah, Wisconsin; and Francis Kiefer, president of the Port Huron Sulphite and Paper Company, Port Huron, Michigan, and chairman, executive committee, Michigan Forest Industries.

Speaking for the forest industries, Sydney Ferguson, chairman of the board, The Mead Corporation, Dayton, Ohio, and head of American Forest Products Industries, termed the Tree Farm program vitally important to the economic security of the United States.

▼

▶▶▶ A SALES OFFICE in Chicago has been opened by the Flambeau Paper Company, of Park Falls, Wisconsin. It is located in Room 1418, 202 South State Street, and Donald R. Kimbark is in charge. Mr. Kimbark has represented various wholesale paper houses for over twenty years, as salesman and sales executive.

▼

▶▶▶ A TWO-STORY addition costing over $100,000 is to be built by the Dominion Corrugated Paper Company, Ltd., of Toronto, Ontario, Canada. The new unit is scheduled to be ready by September, and will replace an old section now being demolished. Increased production and storage facilities will be provided by this 18,000 sq ft concrete and brick building.

▼

▶▶▶ TWO NEW BUILDINGS will be added to the plant of the Sealright Company, Inc., Fulton, New York, this summer. It is estimated this expansion will cost $400,000.

▶▶▶ PRODUCTION OF Foodtainers, moulded pulp prepackaging trays for meats, fruits, and vegetables, is under way in a second plant of the B-F-D division of The Diamond Match Company. The new facilities are located in the division's Ogdensburg, New York, mill and will augment the output of the Plattsburg, New York, unit. Location in Ogdensburg places the new production unit close to the source of the pulp needed for manufacture. The B-F-D operates a large pulp mill there to supply all its paper and pulp product operations.

▼

WESTVACO CONDUCTS BROAD SYSTEM OF TREE-PLANTING ALONG THE ATLANTIC COAST

Another 4,600 acres of cutover or submarginal land along the Atlantic coast are now spotted with pine seedlings as the result of further successful plantings carried out in recent months by foresters of West Virginia Pulp and Paper Company, Summerville, S.C.

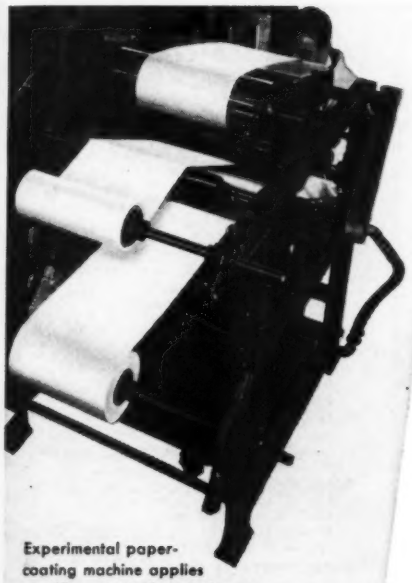
Planting teams employed by the company set out approximately 2,700,000 loblolly, slash and spruce pine seedlings during a three-month season ended in March, according to a report issued last month by the Timber Managerment Division of the company's Southern Woodlands office. The planting is a continuation of a reforestation program which has restored 9,500 acres to full pine production during the past four years. Over this period the company has set out about 6,200,000 seedlings.

More than 150 men made up 13 planting teams which carried out the work by hand of planting on 246 separate plantations scattered over an area of 20,000 square miles in North and South Carolina. The company was unable to use a planting machine because of extremely wet weather during part of the period, plus the difficulties of transportation over the wide area involved.

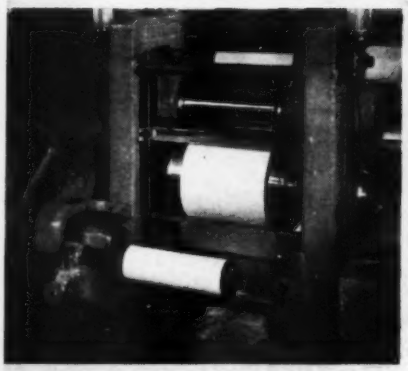
During the season, the plantings made last year were examined by company men and reports indicated that a high percentage of more than 2,250,000 seedlings had survived. Free-ranging stock—horses, cows, pigs, sheep and goats—are damaging the plantations to some extent by biting, scraping, and trampling the trees, the report showed, but none of last year's seedlings have been damaged by fire.

▼

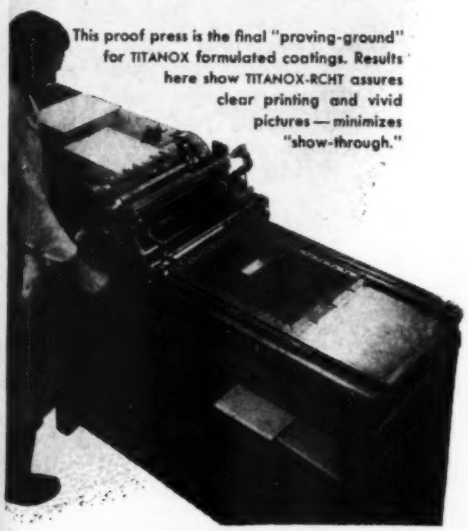
▶▶▶ INCORPORATION OF the Azon Corporation, 6 Gaines Street, Binghamton, New York, to manufacture sensitized paper, with capital of $100,000, was recently announced. Incorporators are William Beese, Frederick O. Trump, and Henry Schmald.



Experimental paper-coating machine applies specific TITANOX formulations.



This pilot calender is another piece of test equipment used to prove the value of TITANOX coatings.



This proof press is the final "proving-ground" for TITANOX formulated coatings. Results here show TITANOX-RCHT assures clear printing and vivid pictures — minimizes "show-through."

To help you make

Better Coated-Papers

with

® TITANOX

the brightest name in pigments

In our Technical Service Laboratory experimental and production tests with paper-coating equipment are constantly being run to develop more effective coatings. In these tests and in large scale runs in the paper industry TITANOX-RCHT has proved its value for making light-coated paper print like heavy.

This rutile-calcium pigment imparts great opacity and brightness to papers and permits the use of modern light weight, thin coatings. The trend to this type of coating make these advantages of TITANOX-RCHT important to you:

Highest opacity and brightness at lowest cost.
Minimizes "show-through" and after-yellowing.
Overcomes transparency from wax, resins, etc.

Our Technical Service Laboratory with modern paper-coating equipment stands ready to help you solve your paper-coating pigment problems. Write: Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; 104 South Michigan Avenue, Chicago 3, Ill.; 2600 South Eastern Avenue, Los Angeles 22, Calif. Branches in all other principal cities.

® TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

7587

Greater Service to Fork-Truck Users

Greater Opportunities for Men Who Sell Them—

Clark Dealer Plan Achieves Both

WITH sales of its fork-lift trucks and industrial towing tractors exceeding all expectations, and with its position of production and engineering leadership firmly rooted in rich, productive soil, Clark Equipment Company, in its 30th year as a builder of materials-handling machines, has found it desirable to establish a nation-wide organization of independent franchised dealers as exclusive distributors of the products of its Industrial Truck Division.

THIS is indeed a far cry from 1939 when the entire output of the Industrial Truck Division was sold with ease by a handful of men!

TODAY'S volume is twenty times that of 1939; and the Company's stature—financial and engineering—is more than twenty times as great as in 1939. A considerable number of the '39 machines are in daily service, and many older machines are in regular operation after 20 and 25 years. The conviction is natural that 30 years hence many '49 machines will still be "on the job" alongside the new output of 1979. There will be no "orphans" bearing the name "Clark."

TO KEEP PACE with increasing demands, and to deliver the broad and competent service which Industry expects from Clark, the Company has chosen this plan of selling through independent dealers as a sound and logical evolution. Until the middle of 1948, approximately one-third of Clark's Industrial Truck Division representatives were on an independent dealer basis. It is expected that by the end of 1949 the nation-wide dealer organization will be complete.

HEADING up the dealerships or actively participating in them are key men of Clark's erstwhile factory-branch sales offices —factory-trained men, tested and proved as capable materials-handling counselors. These men share with Clark management the conviction that they can deliver, under the new plan, a broader and more valuable service to their customers and to all users of mechanized materials-handling; that they face broader, deeper vistas of opportunities which ambitious men so earnestly desire—opportunities for independence, for building greater earnings by their own efforts, for achieving prestige and leadership in their communities.

ANOTHER influence which furthered the plan is the fact that Clark management historically has been engineers and manufacturers. By decentralizing marketing activities, Clark can intensify its emphasis on development of better materials-handling machines and methods—to the end that Clark products shall achieve even higher excellence at lower cost, shall become still more valuable to industrial users and to the dealers who serve them.

THROUGH your Clark dealer, all the advantages of Clark engineering, integrated production and matchless experience are quickly available to you. He is fully qualified to make an unbiased appraisal of your materials-handling operations, and to recommend the type of machine that will serve you most efficiently at lowest cost. It's "good business" to CONSULT CLARK.

CLARK EQUIPMENT COMPANY

INDUSTRIAL TRUCK DIVISION

BATTLE CREEK 22, MICHIGAN

OTHER PLANTS—BUCHANAN • JACKSON • BERRIEN SPRINGS, MICHIGAN

REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

AUTHORIZED CLARK DEALERS

ALABAMA: BIRMINGHAM
*M-H EQUIPMENT COMPANY
845 LOMB AVENUE

ARIZONA: PHOENIX
ROBERT H. BRAUN COMPANY
743 GRAND AVENUE

ARKANSAS: LITTLE ROCK
FRED J. VANDEMARK COMPANY
209 EAST MARKAM STREET

CALIFORNIA: FRESNO 1
ROBERT H. BRAUN COMPANY
505 MASON BUILDING

LOS ANGELES 23
*ROBERT H. BRAUN COMPANY
3008 EAST OLYMPIC BLVD.

OAKLAND 3
*GLEN L. CODMAN COMPANY
10521 PEARMAIN STREET

SAN DIEGO
ROBERT H. BRAUN COMPANY
3872 FIFTH AVENUE

STOCKTON
GLEN L. CODMAN COMPANY
409 BELDING BUILDING

COLORADO: DENVER 2
*J. N. MEADE
420 U. S. NATIONAL BANK
Service: FORK LIFT TRUCK SERVICE
2855 WEST 8TH AVENUE

CONNECTICUT: NEW HAVEN
*C. E. REUTTER CORPORATION
66 AMITY ROAD

FLORIDA: TAMPA
CLARK EQUIPMENT COMPANY
1145 ELLAMAE STREET

ILLINOIS: CHICAGO 4
*MODERN HANDLING EQUIP., INC.
310 SOUTH MICHIGAN AVENUE
(Service: Cook County)
LIFT TRUCK SERVICE COMPANY
6919 SOUTH HALSTED STREET

INDIANA: INDIANAPOLIS 5
*W. A. MARSCHKE & SONS
1121 E. 46TH STREET

SOUTH BEND 14
*MATERIALS HANDLING EQUIP. CO. OF SOUTH BEND, IND.
2625 SOUTH MICHIGAN STREET

IOWA: DAVENPORT
*BIG RIVER EQUIPMENT CO.
1344 WEST THIRD STREET

DES MOINES
*BIG RIVER EQUIPMENT CO.
914 GRAND AVENUE, ROOM 255

KANSAS: KANSAS CITY
Sales and Service:
(SEE KANSAS CITY, MISSOURI)

LOUISIANA: NEW ORLEANS
T. G. FRAZEE
910 CARONDELET BLDG.

MAINE: PORTLAND
BRODIE INDUSTRIAL TRUCKS, INC.
(CONTACT MALDEN, MASS.)

MARYLAND: BALTIMORE
FALLSWAY SPRING & EQUIPMENT CO.
CORNER FALLSWAY & LEXINGTON

MASSACHUSETTS: BOSTON (MALDEN 48)
*BRODIE INDUSTRIAL TRUCKS, INC.
50 COMMERCIAL STREET, MALDEN 48

MICHIGAN: BATTLE CREEK
CLARK EQUIPMENT COMPANY
INDUSTRIAL TRUCK DIV. PLANT

DETROIT 2
*CLARK EQUIPMENT COMPANY
6520 CASS AVENUE
Service: INDUSTRIAL TRUCK SERVICE, INC.
8815 HARPER AVENUE

MINNESOTA: MINNEAPOLIS 2
*MATERIAL HANDLING ENGINEERS
225 SOUTH 5TH STREET, ROOM 201
Service: SMITH-DUNN COMPANY, INC.
2301 UNIVERSITY AVENUE, S. E.

MISSOURI: KANSAS CITY 6
*CLARK EQUIPMENT COMPANY
1009 BALTIMORE AVENUE
Service:
LIFT TRUCK SERVICE & SUPPLY
NORTHWEST 15TH AND McGEE STREETS

ST. LOUIS 8
*MATERIALS HANDLING EQUIPMENT CORP.
3820 WASHINGTON BLVD.
Service:
FORK LIFT TRUCK SERVICE CO.
511 CHANNING STREET

AUTHORIZED CLARK DEALERS

NEW JERSEY: JERSEY CITY
*JERSEY INDUSTRIAL TRUCKS, INC.
34 EXCHANGE PLACE
Service:
BOND INDUSTRIAL MAINTENANCE CO.
51 CLARKSON STREET AT GREENWICH
NEW YORK 14, NEW YORK

NEW YORK: BUFFALO
*BRODIE INDUSTRIAL TRUCKS INC.
1450 MICHIGAN AVENUE
NEW YORK 6
*BOND INDUSTRIAL EQUIPMENT CO.
165 BROADWAY, ROOM 2200 (OFFICE)
Service and Display Room:
51 CLARKSON STREET AT GREENWICH
NEW YORK 14—also
289 BOND STREET, BROOKLYN 31
SYRACUSE
BRODIE INDUSTRIAL TRUCKS INC.
712 STATE TOWER BLDG.
ALBANY (WATERVLIET)
*INDUSTRIAL TRUCK SALES, INC.
BROADWAY AT 25TH, WATERVLIET

NORTH CAROLINA: GREENSBORO
Service Outlet only:
INDUSTRIAL TRUCK SERVICE CORP.
629 SOUTH SPRING STREET

OHIO: CINCINNATI
ROBERT C. YOUNG, P. O. BOX 96
CLEVELAND
CLARK EQUIPMENT COMPANY
522 ROCKEFELLER BLDG.
TOLEDO 10
PERCIVAL L. REYNOLDS, 2558 FULTON STREET

OKLAHOMA: TULSA
ARST EQUIPMENT COMPANY
34 NORTH MADISON

OREGON: EUGENE
PRESTON FALLER COMPANY
891 TAYLOR STREET
PORTLAND 5
PRESTON FALLER COMPANY
1220 S. W. MORRISON STREET

PENNSYLVANIA: PHILADELPHIA 8
*CLARK EQUIPMENT COMPANY
401 NORTH BROAD STREET
Service:
PHILADELPHIA ENGINE REBUILDERS, INC.
330 WEST QUEENS LANE
PITTSBURGH
*MATERIAL HANDLING INCORPORATED
319 THIRD AVENUE

SOUTH DAKOTA: SIOUX FALLS
CENTURY EQUIPMENT & SUPPLY CO.
22 WEST 7TH STREET

TENNESSEE: MEMPHIS 3
*FRED J. VANDEMARK COMPANY
1110 UNION AVENUE

TEXAS: DALLAS
*T. G. FRAZEE
1012 FIRST NATIONAL BANK BLDG.
Service:
TRUCK EQUIPMENT COMPANY
2409 COMMERCE STREET
HOUSTON
*T. G. FRAZEE, 810 PETROLEUM BLDG.

UTAH: SALT LAKE CITY
A. J. ISAACSEN, JR.
45 SOUTH 3RD WEST STREET

VIRGINIA: NORFOLK
*McLEAN-SHAND, INC.
955 WEST 21ST STREET

WASHINGTON: SEATTLE 1
*PRESTON FALLER COMPANY
1921 MINOR AVENUE
SPOKANE 9
PRESTON FALLER COMPANY
EAST 41 GRAY AVENUE

WISCONSIN: MILWAUKEE 2
*CLARK EQUIPMENT COMPANY
759 NORTH MILWAUKEE AVENUE, ROOM 623
Service: LIFT TRUCK SERVICE CO.
5710 WEST NATIONAL AVENUE

DISTRICT OF COLUMBIA: WASHINGTON
CLARK EQUIPMENT COMPANY
927 15TH STREET N. W.

TERRITORY OF HAWAII: HONOLULU
*PRESSED STEEL CAR COMPANY
538 REED LANE, P. O. BOX 300

*Sales and Service.

For Names and Addresses of Export Distributors, write to: Export Division, Clark Equipment Co., Battle Creek, Mich., U.S.A.

New Process for Coating Kraft Papers

▶▶▶ ADDITIONAL MARKETS for the use of the multiwall bag are promised by a new process for coating kraft papers with synthetic resins, most notably polyethylene, which process has been developed by the Research and Development Department of St. Regis Paper Company, working in conjunction with technicians of the DuPont Company.

The Packaging Division of St. Regis has long recognized the benefits to be obtained from the use of resin coated plies for multiwall paper bags, but heretofore the high cost of the application has proved a barrier to the broad expansion in this type of package.

With its new coating operation in production, St. Regis reports that it is in a position to provide, on an economic basis, a multiwall bag containing a sheet of kraft paper coated with polyethylene for many heretofore unpackable or hard to pack materials.

The characteristics of the polyethylene multiwall bag, it is pointed out, make it a superior container for the packaging of hygroscopic materials, particularly in the chemical and food fields, and notably for the protection of original fresh-packed quality in the food field.

Multiwall bags containing polyethylene coatings have been in commercial use for over a year and the success attained has indicated, the company reports, that the improved moisture and grease-proof protection provided by bag walls coated with this synthetic resin marks an outstanding advance in the technology of multiwall bag construction.

The polyethylene coating, according to St. Regis researchers, is the best yet developed in the whole field of paper coatings for packaging purposes. It is pointed out that polyethylene to a substantial degree is unaffected by acids and alkalis, provides an excellent grease and oil barrier and is odorless and tasteless.

The company states that in addition to its efficiency as a moisture-proof, grease-proof and chemically inert substance in multiwall bags, polyethylene also strengthens the sheet to which it is applied.

The efficiency of the polyethylene coated bag has been tested and approved under actual conditions in a number of plants of customers of St. Regis. These tests included the packing of meat trimmings, calcium chloride, powdered skim milk and synthetic resins.

Superintendents Convention . . .

(Continued from page 438)

Howard P. Waldenmyer, Oxford Paper Co., Rumford, Me.

Harold Skinner, Marathon Corp., Rothschild, Wis.

Clyde Faulkender, Hoberg Paper Mills, Green Bay, Wis.

Luther Beighey, Hammermill Paper Corp., Erie, Pa.

Joseph H. LaChance, Rayonier, Inc., Fernandina, Fla.

Board

Chairman—Glen Renegar, Container Corp. of America, Philadelphia, Pa.

Co-Chairman—Walter B. Morehouse, Nopco Chemical Co., Harrison, N.J.

Panel Discussion—Approach Flow and Factors of Vat Design for Uniform Formation and Weight Distribution, moderator, Philip H. Goldsmith, Pusey & Jones Corp., Wilmington, Dela.

Panel Members:

Paul Easton, Bulkey-Dunton Pulp Co., Inc., New York, N.Y.

T. A. McArn, Downingtown Mfg. Co., Downingtown, Pa.

S. T. Weber, The Black-Clawson Co., Hamilton, O.

Sveen-Pedersen Save-Alls in Board Machine Mills and the Re-Use of the Water, Paul Easton, Bulkley-Dunton Pulp Co., Inc., New York, N.Y.

Approach Flow to Cylinder Vats, Philip H. Goldsmith, Pusey & Jones Corp., Wilmington, Dela.

Building Versatility into a Fourdrinier, Theodore A. McArn, Downingtown Mfg. Co., Downingtown, Pa.

The Hydronamic Flow System for Vats, S. T. Weber, The Black-Clawson Co., Hamilton, O.

Kraft

Chairman—Philip J. Hannan, Southern Advance Paper Co., Hodge, La.

Co-Chairman—Allen Hyer, Bagley & Sewall Co., Watertown, N.Y.

Use of Chip Weightometer in Kraft Mill Operation, J. Thompson and Fred W. Bishop, Southland Paper Mills, Inc., Lufkin, Tex.

Care and Use of Chipper Knives, Collins B. Newell, Simonds Saw & Steel Co., Fitchburg, Mass.

Balanced Stock Preparation, W. A. White, Shartle Bros. Co., Middletown, O.

Power

Chairman—Roland A. Packard, The Bagley & Sewall Co., Watertown, N.Y.

Co-Chairman—C. D. Cummings, SKF Industries, Philadelphia, Pa.

Lubrication and its Effect on Paper Mill Operating and Maintenance Costs, J. P. Critchlow and D. R. Kroell, Gulf Oil Corp., Pittsburgh, Pa.

The Effect of Condensate and Air on Output, Quality and Steam Consumption of Paper Machine Dryers, Albert Milnes, Sarco Co., Inc., New York, N. Y.

Steam for Power, Colored sound film by Babcock and Wilcox Co., New York, N.Y.

Graphic Arts

Chairman—Robert W. Pattison, Cellulose Fibres, Inc., Holyoke, Mass.

Co-Chairman—F. A. Soderberg, General Dyestuff Corp., New York, N.Y.

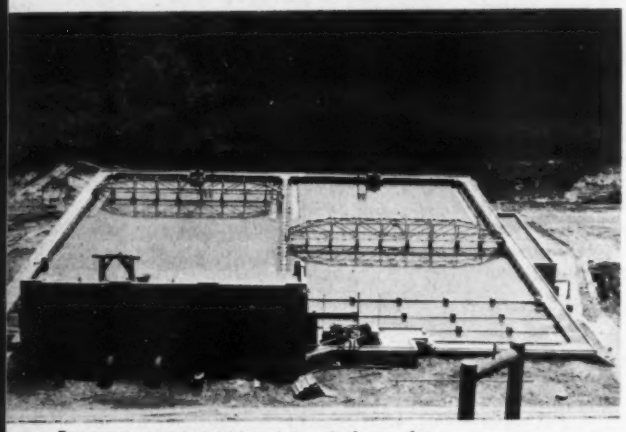
Paper Testing in Relation to End Use, M. S. Kantrowitz, Technical Director, U. S. Government Printing Office, Washington, D.C.

New Paper for New Inks, George Cramer, Sinclair & Valentine Co., New York, N.Y.

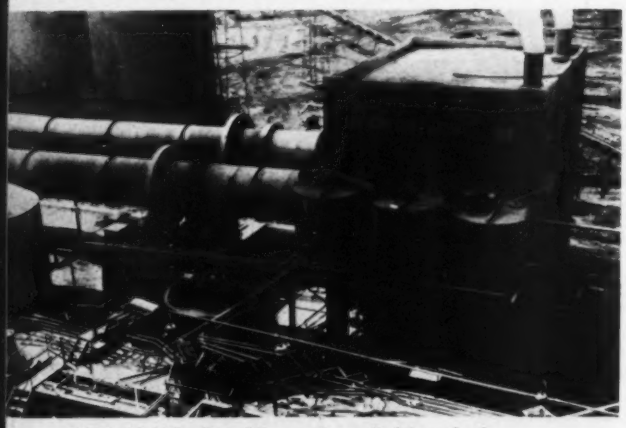
Paper—The Printer's Raw Material, Robert W. Pattison, Cellulose Fibres, Inc., Holyoke, Mass.

WOOD—abundant supply is basis for an industry

Herbert A. Kidd, vice president and general manager



WATER—25,000,000 gal treated per day



CHEMICALS—lime kilns and causticizing plant

PAPERBOARD—650 tons is the daily record so far

Making

▸▸▸ NOW IN ITS SECOND year of production, the Macon Kraft Company (Macon, Ga.) is one of the South's important producers of kraft board. The 216-in wide x 547-ft long Beloit fourdrinier machine, nicknamed the "Buccaneer" after "Captain" Herbert A. Kidd, vice president and general manager of the Macon plant, operates at 1200-1400 fpm and averages about 570 tons of 16-point, 42-lb board per day with a single day's record of nearly 650 tons. But that's only part of the story. Behind this paper machine is the pulp mill, power plant, chemical recovery plant, wood yard and the other services integrated into one efficient unit to produce high quality board from the South's abundant resources.

One day's production of paper requires about 1,100 units of wood, over 15,000,000 gallons of water and 230 tons of coal. Some 11,000,000 pounds of steam per day are turned out by the boilers, over half of which results from burning black liquor and bark. The electrical load averages 14,000 kw-hr. Over 80,000 tons of air per day is handled by the 33 fans of the drying and ventilating system. The dryer section of the machine is covered by a 362-ft Ross hood, the longest on record. Upwards of 200 pumps are required for the transfer of fluids and slurries.

Most important, it takes about 640 persons with a wide variety of skills to operate this modern mill. Of practical value to the community is the $40,000 weekly payroll that accrues from this mill's multimillion dollar investment made by The Mead Corporation and Inland Container Corporation who jointly own and operate this enterprise.

Directors and officers of Macon Kraft Company were chosen from men associated with the two parent companies. Key men responsible for the efficient operation of this plant under Herbert A. Kidd's management are: James A. May, assistant to the vice president; R. W. Childers, general superintendent; R. A. Rock, industrial relations manager; W. M. Ebersole, pulp superintendent; C. J. Plumlee, paper superintendent; L. C. Crowder, plant engineer; W. C. Waits, wood supervisor; S. A. Johnson, finishing superintendent; A. D. Simpson, power plant superintendent; L. E. Goodwin, chief chemist; S. W. Rose, chief meterman; S. D. Frost, master mechanic; and John S. Kirkland, chief electrician.

George F. Hardy & Son designed the mill, and James Stewart & Company, Inc., New York City, was general contractor for the job. Rowland Tompkins Company, New York City, handled piping installations, and Huntington & Guerry, Greenville, S.C., made the electrical installations.

W. M. Ebersole, pulp supt.; L. E. Goodwin, ch. chemist; J. Jordan, tour boss; Carl Plumlee, paper supt.; "Jack" Frost, master mech.; A. D. Simpson, power plant supt.; W. B. Simmons, chemist; S. A. Johnson, finishing supt.; and H. C. Gibbs, mach. tender

Paperboard at Macon

From the Ocmulgee River, water is pumped about 2 miles to the mill through a 30-inch diameter pipe line by 3 Layne Atlantic 5,200 gpm vertical centrifugal pumps. Water used for processing is treated, but that required for the condensing turbines is used as is. Any excess water returns to the river over a 20-ft high pipe loop into a second 30-inch pipe line used to transport mill effluent back to the river.

The water treatment plant employs controlled sedimentation and has a capacity of 25,000,000 gallons per day. The Dorr Company supplied equipment for this plant which includes Omega chemical feeders for alum and lime, a flash mixer for mixing chemicals with raw water, two flocculators for coagulation of treated water and two Monorakes installed in concrete tanks for clarification of treated water. Precipitated solids are removed by two Dorrco sludge pumps. Sluice gates and valves were furnished by Chapman Valve Manufacturing Company. A 100,000-gallon water tower provides fire protection to the mill and yard.

Chemicals

Principal chemical raw materials used in the pulping process are salt cake and lime, although some elemental sulphur also is employed. Salt cake is stored in a 300-ton capacity steel silo while an additional 2,000 tons is stored in a salt cake house. A Fuller Company pneumatic conveyor system transfers salt cake from cars to storage and also from storage to process. Lumps of salt cake rejected by screening are reduced to proper size by a 10-ton per hr American Pulverizer Company hammermill.

Fresh lime is stored in a recently built 650-ton storage tank, and the old 160-ton storage tank is now used for hot lime from the kilns.

Wood Preparation

Wood is received at the mill via both rail and truck and is unloaded either manually or by use of Lima power cranes with orange peel buckets. The woodyard will hold up to four months supply for the pulp mill and is arranged in piles adjacent to the three 381-ft lug chain conveyors. Considerable work is underway on the woodyard. A stacking conveyor has been built and a flume conveyor system is under construction.

From storage or direct from railroad car or truck the wood is loaded on chain conveyors that transfer wood to the drum barkers. Three Carthage barking drums, each served by an individual inclined chain conveyor operate in parallel. These 12 ft x 40 ft barkers are each driven at 5 rpm through a ring gear and pinion by a 125-hp totally-enclosed motor and reduction gear.

Bark falls through slots in the drums to hoppers and is transferred by a drag chain conveyor system to a specially designed storage bin from which it is withdrawn as fuel for the bark burning boiler. Wood is washed in a water spray and transferred either to the chippers or to storage.

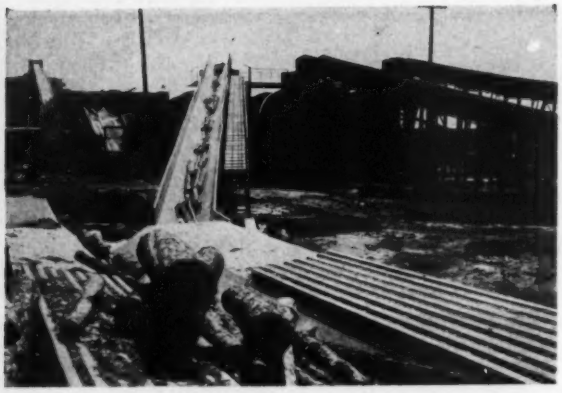
Two 88-in diameter, 12-knife Carthage chippers, each with a capacity of about 35 units (168 cu ft = 1 unit) per hour, will handle wood up to nearly 18 inches in diameter. Each chipper is direct-connected to a 600-hp, 327-rpm Electric Machinery Manufacturing Company synchronous motor. Constant speed of the synchronous motor under varying load conditions insures uniformity of chips. Chipper knives are sharpened on Hanchett grinders.

Chips are carried by a 48-in. wide scraper conveyor to a transfer station adjacent to the chipping plant. Here the chips may go directly to the digesters or they may be conveyed to storage. The 48-in wide troughed chip conveyor belts are chain driven by Westinghouse motors and Jones speed reducers.

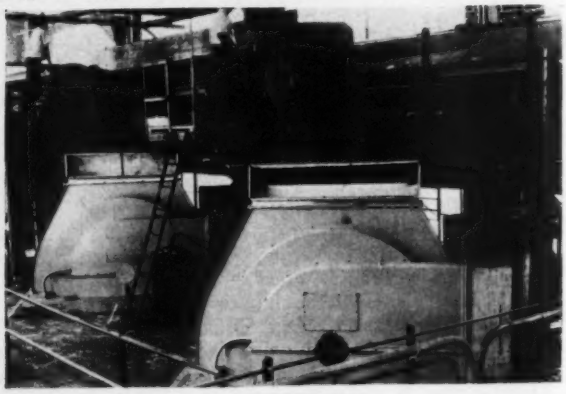
From the transfer house the 142-ft long inclined belt conveyor delivers chips to an 81-ft scraper conveyor atop the two steel storage silos. Each silo, with a capacity of about 300 units of chips, has a four-hopper bottom. Each of the four hoppers on each silo discharges by means of a lateral feed conveyor to a belt conveyor passing from underneath both silos under a magnetic separator to the transfer station where the chips are transferred to the digester feed conveyor.

Tramp iron is removed from the chips by a self-cleaning, magnetic separator. This unit consists of a short endless transverse belt passing over the chip conveyor at right angles. Inside the belt between the two end pulleys is the Dings electric magnet which draws any tramp iron from the chip conveyor onto the moving transverse belt. As this belt moves past the edge of the magnet, the metal drops off.

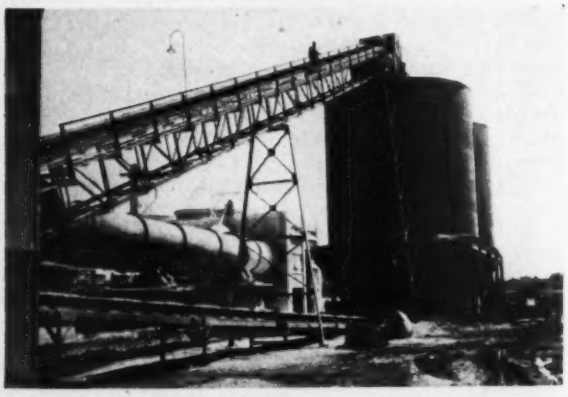
From the transfer station the main 445-ft inclined belt conveyor passes over a Merrick Weightometer that automatically records the weight of chips going to the digesters. At the top of the digester house, the inclined conveyor discharges onto a 50-ft horizontal reversible shuttle belt conveyor that is automatically positioned to fill each of the digesters. The conveyor system is operated by remote control from the digester room since the digesters are charged direct from storage without use of overhead feed hoppers. The complete wood, bark and chip conveyor system was supplied by the Jervis B. Webb Company.



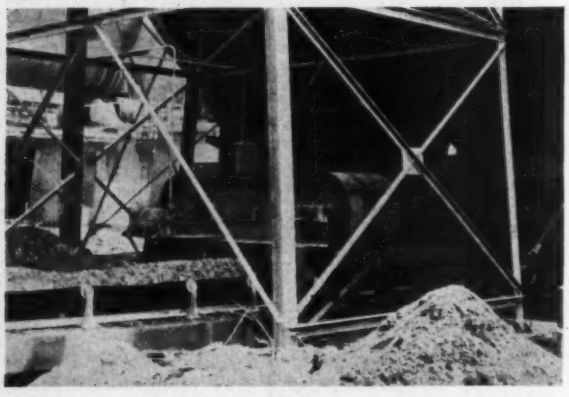
Logs conveyed to barking drums



Synchronous motor-driven 12-knife chippers



Chips conveyed to storage silos



Self-cleaning magnetic separator

Pulp Mill

Each of the six 4,300-cu ft digesters built by Chicago Bridge and Iron Co. has a capacity of about 12½ tons of pulp operating on a 3-hr cycle per cook. Cooking liquor is metered by Foxboro instruments to the digesters from two white liquor measuring tanks and one weak black liquor measuring tank. A Mason-Neilan automatic digester control system, including control valves, is employed. Supplied as "packaged units" on a twelve-section panel board, this system meters steam for cooking and controls gas relief. Steam to each digester is metered and controlled on a time-program rate of flow basis. Cooking time and total volume of steam can be varied by the operator by simple adjustment of the cam follower. Gas relief is controlled by temperature-pressure relation controllers. Automatic blowback of the relief screen, whenever it becomes plugged, is a feature of this system.

Cooked pulp is discharged from the digesters by 10-inch diameter automatic, electrically-operated Yarway blow valves, remotely controlled from the digester operating floor, into one of two blow tanks. Here the pulp is diluted to about 4 per cent consistency with black liquor which is added according to demand of torque consistency regulator hooked up to the paddle agitator.

Gas vented from the digesters during cooking passes to a Foster-Wheeler turpentine recovery system. Non-condensable gases are collected and the condensed liquid containing turpentine goes to a separator tank from which crude turpentine is decanted and sent to storage tanks.

Since uncondensable gases from the digesters are a principal source of bad odors associated with the sulphate process, an effort is being made to eliminate this nuisance. Equipment has been installed to collect these gases and a specially designed kiln or incinerator has been built in the yard where they are burned. If this is successful, it will be the first instance where the odor from kraft mills is eliminated.

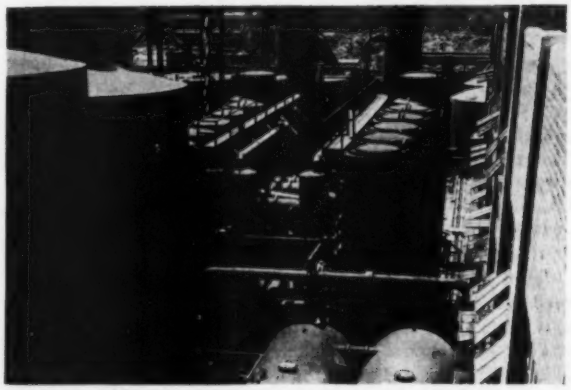
Flash steam is formed in blow tank due to the sudden drop of pressure when a digester is blown. Heat from this steam is utilized to heat wash water by means of a Rosenblad heat recovery system furnished by the American Heat Reclaiming Corporation. Here the flash steam is condensed in a jet condenser using cooled condensate as the condensing medium. Hot condensate from the condenser is stored in an accumulator tank from which it is pumped through spiral heat exchangers where fresh water is heated. Cooled condensate from the heat exchangers is returned to the bottom of the accumulator to be used again as the cooling medium of the jet condenser. Condensate is cooled to approximately 110 Fahr.

Washing and Screening

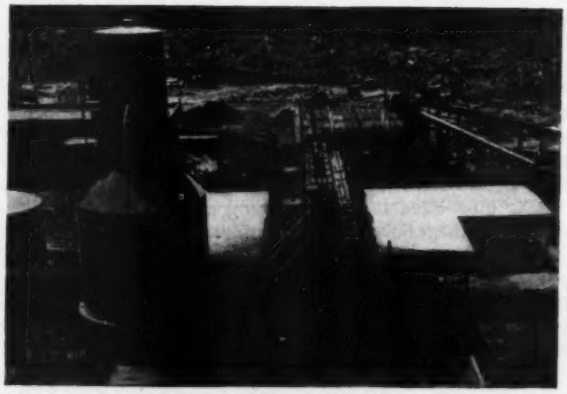
An Improved Paper Machinery system is employed for washing and screening of the pulp. Brown stock from the blow tanks is pumped to a battery of Impco vibrating knotters where it is diluted further with black liquor to about 1½ per cent consistency. Knotter rejects are transferred by inclined drag conveyors to the roof of the washer building and then back to the shuttle conveyor where they are returned to the digesters for recooking. Screen rejects from the tailing screens are also pumped to a dewatering screen (similar to a fourdrinier wire) and returned with the knotter rejects to the digesters. Recovery of knots and screenings improves the pulp mill yield. This system is unique and was developed at Macon.

After deknotting, the brown stock is washed in two sets of four-stage countercurrent vacuum washers. Forty mesh stainless steel wire screens cover the 8 x 16 ft washing drums. Filtrate from each of the four-stage washers discharges to individual seal tanks through the barometric legs that create vacuum for the washers. The four horizontal fil-

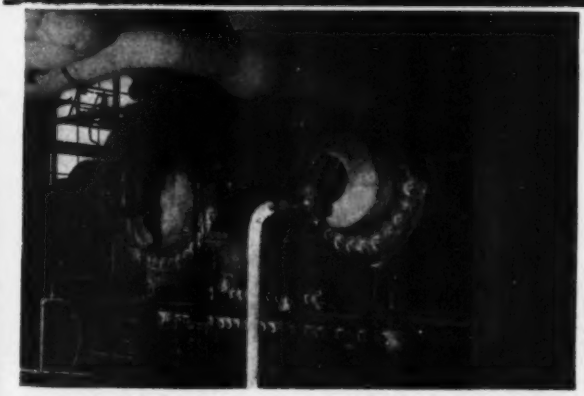
4-stage brown stock washer and instrument panel



Black liquor evaporators



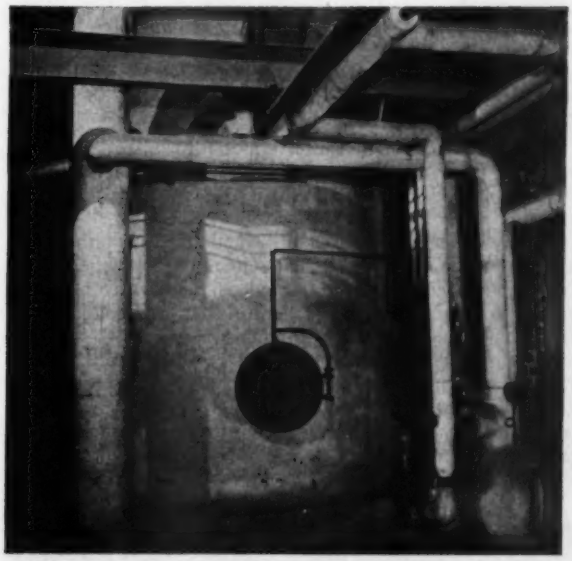
Salt cake silo (left) and bark storage bin



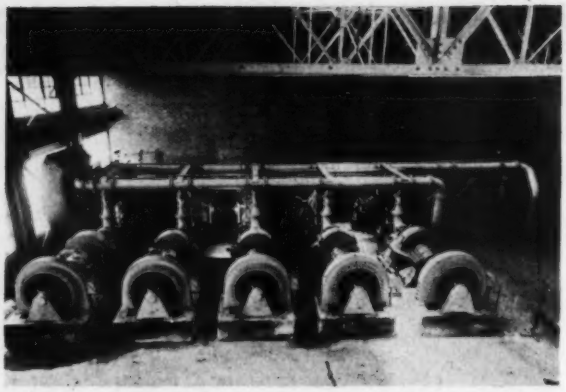
Recovery furnace

Centrifugal foam breakers and foam tower

Water intake pumps at river



Boiler feed steam jet deaerator



Twelve disk refiners

trate seal tanks are surmounted by a foam tower equipped with twin Impco centrifugal foam breakers.

Vapor from the brown stock washers is removed by a Ross hood and exhaust system. A Foxboro control panel is used for the brown stock washing system. Two Leeds & Northrup conductivity recorders are employed, to check soda losses. One unit measures conductivity of slush pulp from the washers and the other measures the conductivity of the final effluent from the washer room. Fiber and chemical losses are determined by analyzing samples collected by De Zurik samplers in the paper mill and pulp mill sewers.

Washed stock is diluted with white water to about 1¼ per cent consistency by means of a Trimbey regulator and is fed through a flume to a row of nine Impco rotary screens, two of which are tailing screens for rescreening rejects. As previously mentioned, tailings are returned to the digesters for recooking. Screened stock drops to a chest from which it is pumped to a pair of 8 x 16 ft Impco vacuum thickeners. Dewatered stock at about 8 per cent consistency discharges to the deckered stock chest. The 5 stock chests in the pulp and paper mill are of standard Stebbins Semtile construction.

Chemical Recovery

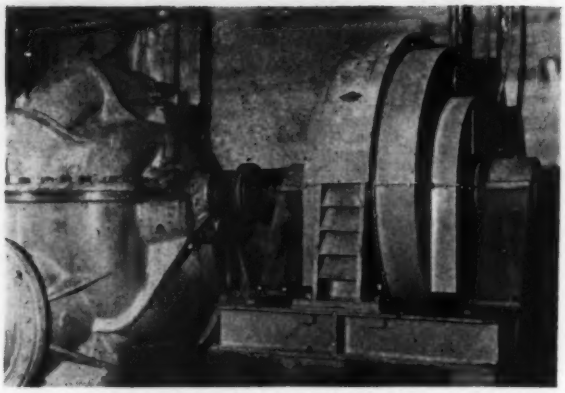
Weak black liquor at 17 per cent solids from the filtrate tank is transferred to two 200,000-gal storage tanks from which it is pumped to two sets of 6-body, 5-effect General American evaporators. The first effect body of each set of evaporators, in which the maximum concentration of liquor is reached, is of stainless steel construction. The lower portion of the vapor bodies are stainless steel lined and clad, deflectors are stainless steel, top and bottom tube sheet are stainless steel clad and tubes are stainless steel. Corrosion resistant black liquor pumps of stainless steel and Worthite are employed.

Resins and oils in the black liquor form a soap and are removed from the evaporators and sent to either of two soap skimming tanks. The soap solution contains crude tall oil.

Following the modern trend, evaporators are unhoused. Evaporators are of the integral, self-supporting type, eliminating the need for erecting independent structural supports. Foxboro Instruments control the evaporators and these are housed in a control room.

Leaving the evaporator at 50-55 per cent solids, heavy black liquor is further concentrated to 65-70 per cent solids in Murray cascade evaporators through which pass the hot gases from the recovery furnace. Dust remaining in the flue gas is removed by two Research Corporation Cottrell precipitators, operating in parallel.

Salt cake makeup and the chemical dust recovered by the precipitators is added to the heavy black liquor in mixing tanks and the mixture is pumped to the nozzles of the two Combustion Engineering recovery furnaces.



Fan pump—28,000 gpm

Liquor Making

Molten smelt flows from the bottom of the recovery furnaces into dissolving tanks containing weak wash liquor from the causticizing system to form green liquor. This is pumped through a continuous tray type clarifier and the clear green liquor sent to an 88,000-gal storage tank. Dregs are washed and discarded and the weak wash liquor reused. The liquor making system, including clarifiers, causticizers, mud washers and filters was supplied by the General American Transportation Corporation.

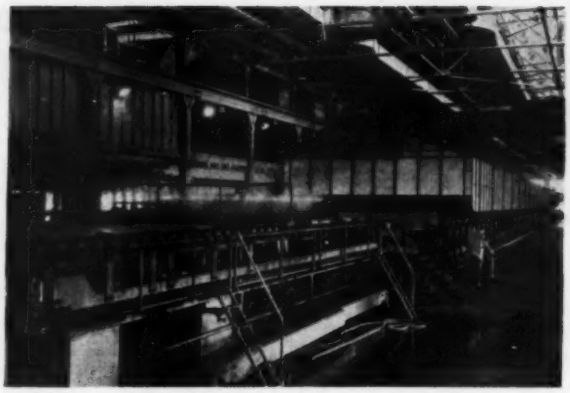
From storage, clarified green liquor is pumped through a heat exchanger before it goes to the rotary slaker where it is mixed in proper proportion with recovered lime and makeup lime. The rotary slaker, built by Allis-Chalmers, is 7 ft x 50 ft long and is the first one of this type to be installed for slaking lime in green liquor. When necessary, elemental sulphur is added to the lime slurry at this point, to increase the sulphidity of the cooking liquor.

The 3-stage causticizing system is comprised of three turbomixer agitated reaction vessels, hooked up in series. Milk of lime from the slaker is pumped to the first of the causticizing tanks where it is mixed with additional clarified green liquor. This system is continuous with the liquor overflowing from the first tank to the second and then to the third. Total retention time is about 1½ hr.

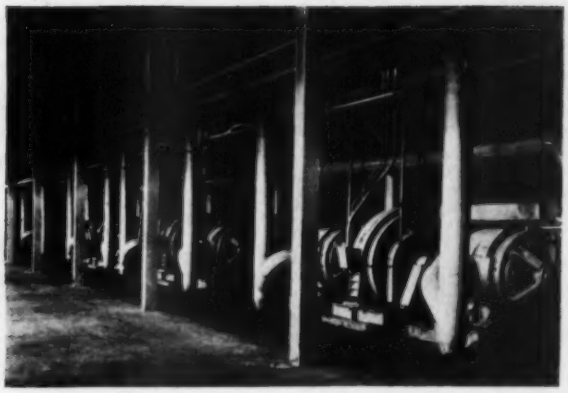
Fully causticized liquor containing calcium carbonate in suspension then flows to the white liquor clarifier. Here sludge is removed continuously from the bottom of four compartments and the clear white liquor overflows at the top and is pumped to two 200,000-gal storage tanks from which it is transferred to the measuring tanks in the digester room.

Sludge from the clarifier is washed by mixing it with filtrate from the sludge filters and then thickening in a mud washer, identical in structure and operation with the white liquor clarifier. Overflow from the thickener goes to the weak wash storage and then used in the dissolvers. Sludge is then pumped to two 6 x 8-ft Conkey rotary vacuum filters covered with 250-mesh Monel wire cloth where it is washed and thickened to about 56 per cent solids before being fed via screw conveyor to two rotary lime kilns. Each filter is hooked up to a Nash vacuum pump.

The kilns, built by Allis-Chalmers, are lined with refractory by L.I.M.E. and are 175 ft long, 10 ft diameter at the feed end, and 11 ft diameter at the discharge end. They are equipped with a 60-ft heat recuperating chain system which reduces exhaust gas temperatures to about 450 Fahr. Exhaust gases from each kiln pass through American Filter Company Rotoclones to recover lime dust and prevent atmospheric contamination. Burnt lime discharges from the end of the kiln and is transferred to hot lime storage with Jeffrey conveyors. Temperatures in the kilns are measured



The Buccaneer—547 ft. long



Eight vacuum pumps in a row

and recorded by Brown radiation pyrometers while the remainder of the control system is comprised mainly of Hays instruments.

Most of the pumps used for handling liquors of different kinds, slurries, water and stock were supplied by Worthington, Ingersoll-Rand and Allis-Chalmers. Corrosion resistant alloys such as stainless steel, Ircamet, Ni-Resist, and Worthite are extensively used.

Over 40 tanks for such various purposes as chip storage, salt cake storage, liquor storage, and seal tanks were supplied by the Chicago Bridge & Iron Company.

Stock Preparation

Washed, screened pulp from the decker chest is diluted to about 3 per cent consistency and is pumped through 12 parallel operated Sutherland refiners. Each of the 42-in disk refiners is direct-connected to a 350-hp, 450-rpm E. M. synchronous motor. Constant speed of the synchonous motors under all load conditions and voltage variations aid in obtaining uniform stock preparation.

After a single pass through the refiners, stock drops to the machine chest from which it is pumped to the regulating box before flowing to the fan pump. White water from the wirepit is mixed with pulp and delivered to the machine headbox by the 28,000-gpm Ingersoll-Rand fan pump driven by a 250-hp dripproof E. M. synchronous motor. Alum solution is added just prior to the fan pump while size is added to the stock prior to refining.

Size is prepared by a Hercules automatic emulsifying process (cf. P.I. and P.W., Jan. 1949 p. 1453). Alum solution is stored and diluted in rubber lined (U. S. Rubber Company's Permabond) steel tanks to avoid contamination. Alum and size are handled by Duriron Company pumps made of Durimet-20.

Making Paper

Stock is delivered by the fan pump through Transite pipe and the "cross-flow" distributor to the headbox of the Beloit machine. The headbox contains five rectifying rolls with a slice adjustable by either an air motor or a hand operated ratchet jack. Formation on the 216-in wide x 130-ft long wire is aided by a double shake and water is extracted by 10 suction boxes with individual air water separators and two 40-inch diameter suction couch rolls. A dandy roll is located about 2/3 down between slice and couch while a rubber covered lump breaker rides over the main couch.

Rapid wire changes are effected by draping the new wire in the aisle while the machine is still running. Then the machine is shut down and the fourdrinier run out into the draped wire. When the fourdrinier is returned to place and reassembled, the machine is ready to go again.

White water from the wire pit returns to the fan pump —water and pulp from the couch pit is sent to an 8 x 16-ft Impco save-all. Recovered fiber is returned to the decker stock chest.

From the couch, the web passes under the air roll onto the first press felt. Two dual presses are employed, each of which utilizes a Stonite center roll. The first press has two suction rolls with an auxiliary press roll atop the first suction roll. The second dual unit uses a suction roll and a plain, rubber smoothing roll. Stowe Woodward furnished the rubber-covered and Stonite rolls used on this machine.

The two wet felts are kept clean with individual Vickery felt conditioners, both operated off a single Nash pump. Air motor jacks are installed on the felt stretchers. Most of the rolls are raised with air cylinders making it possible to change felts with only one lift by the overhead crane.

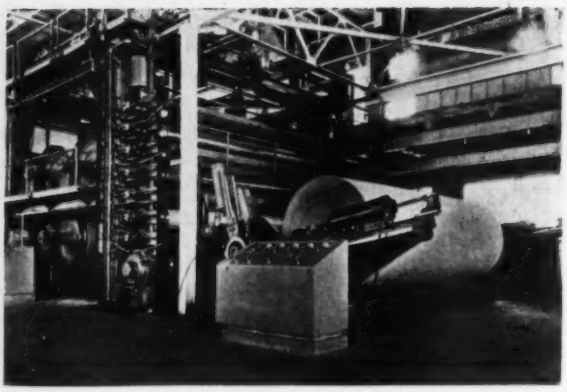
Suction is applied to the flat boxes and press rolls by a battery of 10 Nash vacuum pumps. Each splashproof motor is coupled to two vacuum pumps. Synchronous motors are desirable for low speed operations such as this because of their high efficiency. An air-water separator is installed in the vacuum line to the primary couch.

Helper motors are hooked up to the two couch rolls, the suction press rolls and other rolls on the wet end. These General Electric variable speed, d-c motors range in size from 100 hp on the couch and press rolls to 1 hp on the air roll. Power is supplied to these motors from a G-E d-c generator located on the end of the machine lineshaft drive and by an auxiliary motor generator set. Use of helper motors prevents undue stress on the wire and felts and materially aids the smooth trouble free operation of this machine.

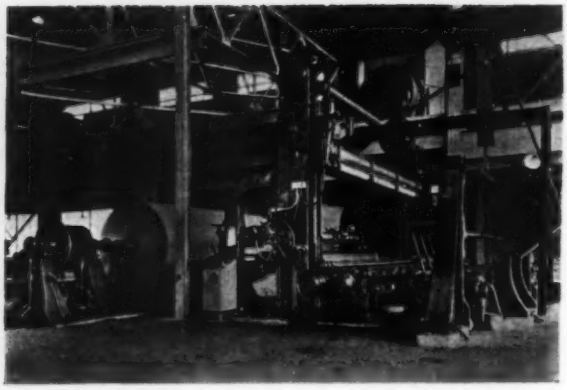
A 2000 hp Westinghouse turbine turns the lineshaft of the Beloit mechanical drive through a Falk gear reduction unit. Control of tensions or draws between the different sections is accomplished by positioning the leather belts operating on cone pulleys of the line shaft in the basement and the hypoid gear units of each section. An air-operated diaphragm clutch is used to start and stop each section but each unit is equipped with air operated brakes for quick stopping. Machine speed is regulated by controlling the turbine drive. Leather belts were supplied by Alexander Brothers and J. E. Rhoades & Sons.

Pressure is applied to all press rolls by air operated diaphragms. These are controlled by Foxboro instruments as are the air controls on the sectional drive units. These are mounted on individual unit panels for each section. Six dryer sections with 102 paper dryers, each 60 inches in diameter, together with 3 calender dryers and 22 felt dryers, remove water vapor from the sheet and felts. A breaker stack is located between the third and fourth dryer sections. Certain dryers and rolls are equipped with Lodding doctors.

Steam pressure of 100 psi is used in the dryers and is regulated by Foxboro recording pressure controllers. A Midwest-Fulton drainage system controls condensate removal as well as the distribution of steam to the different



Open side calender and air-controlled reel



Beloit winder and shaft puller

sections. Antifriction bearings on the dryers and the enclosed drive gears are lubricated with a Bowser pressure lubrication system wherein the oil is continuously cleaned, filtered and recirculated.

Dryers are followed by wet calender stack, three calender dryers and a finishing stack. Open side calenders are employed and are equipped with air loading and a motor operated lift. The improved Beloit drum reel is equipped with primary reel starting arms and an automatic transfer device that brings the reel from a position vertically atop the drum to a horizontal position on the secondary arms where the reel is built to full size. Air cylinders govern the pressure of the reel on the drum and are controlled from a panel adjacent to the reel. Broke is repulped in a Shartle broke beater.

Jumbo rolls are transferred to the Beloit winder and slitter by a 10-ton Reading floor control electric crane. The winder is equipped with a shaft pulley where the rolls are removed from the core shaft and transferred to the roll conveyor which carries them to a scale where they are weighed. Finished rolls then move on a roller flight conveyor which loads them onto an automatic motor-driven shuttle car which in turn delivers them automatically to an elevator which lowers the rolls to the basement. Rolls then discharge to a flight conveyor that transports them to storage or to the rail shipping platform. Conveyors are all installed flush with floor level.

The 352-ft-long paper machine hood and exhaust system furnished by the J. O. Ross Engineering Company is the largest installation of its kind. Two Ross-Grewin systems and two felt supply systems are included. The machine room ventilating system consists of four heating and ventilating units directing air toward the roof and includes eight air makeup units located on the mezzanine at either side of the machine room. One 30-hp fan furnishes cooling air for the calenders.

Steam and Power

Black liquor, bark and pulverized coal are the three types of fuel that supply the steam requirements of the mill. The two recovery furnaces generate about 4,500,000 pounds of steam per day; the bark burning boiler produces about 1,600,000 pounds, and the two coal fired units have a daily output of about 4,500,000 pounds. Superheated steam at 850-900 psi drive the power turbines where exhaust steam is employed in various processes throughout the mill. All boilers were designed and built by Combustion Engineering-Superheater, Inc. The coal-fired units are equipped with Raymond pulverizers that grind the daily average coal consumption of about 230 tons.

Coal is weighed with a Merrick Weightometer as it passes to the bunkers on an 18-in wide belt at 75 tons per hr. Four Richardson automatic coal scales receive coal from the overhead bunkers and deliver a weighed amount to the pulverizer feed hoppers. Link-Belt coal conveyors are used.

A Hofft furnace is installed on the bark boiler and is the first of its kind to be put in operation. Water-cooled dump grates are used in place of cast iron grates to lower maintenance cost and to cut down time. Approximately 2,650 pounds of steam from bark per ton of paper is generated in this unit.

Both Bailey and Leeds & Northrup instruments are employed to measure, record, and control the many variables of steam plant operations. Forced and induced draft fans are supplied by American Blower Company. All boilers are served by a single 300-ft high brick chimney built by M. W. Kellogg Company. Soot blowing equipment was supplied by Diamond Power Specialty Company, using 350 psi air from three 2-stage horizontal V belt driven Worthington compressors. General mill air at 100 psi is supplied by two 2-stage compressors direct connected to individual 200-hp E. M. synchronous motors.

Boiler feed water is treated in a 220,000-lb-per-hr Worthington hot lime-soda-phosphate softener of the deaerating type. Reduction of silica content is accomplished in this treatment. A filter backwash system maintains the filters in good condition without loss of water and without disturbing the water being treated. Feed water makeup is actually about 170,000 lb per hr. Two Ingersoll-Rand feed pumps are powered by 700-hp Westinghouse motors and one auxiliary feed pump is driven by a 700-hp Terry steam turbine.

A United Conveyor Corporation ash handling system is employed. From the ashpit hoppers the ashes are slurried with water from a high pressure jet pump and pumped to a fill area. Fly ash from the dust collection hoppers is removed with a pneumatic system before being mixed with water and discharged to the ash sluice.

Electric power is generated by three General Electric turbine generators. Two of these are 5,000 kw-hr units with extraction and condensing turbines, one extracting at 155 psi and the other at 40 psi. The third unit is a 7,500 kw-hr extraction back pressure turbine generator. Foster-Wheeler condensers and air ejectors are used in condensing turbines. Because of the many synchronous motors in the plant a power factor of 99 per cent is maintained.

Westinghouse metal clad switch gear, equipped with air breakers, is employed to distribute power to the mill. Average load for the plant is about 14,000 kw-hr.

Although equipment is installed for emergency tie-in with the public utility, an auxiliary source of power has been provided so that essential service can be maintained in case of failure or shutdown of the main power plant. This consists of a diesel generator unit. A Chicago Pneumatic Company diesel engine is direct-connected to the Electric Machinery Manufacturing Company's 500 kv-a, a-c generator.

Thermoelectric Pyrometry

C. C. ROBERTS and C. A. VOGELSANG
Brown Instruments Div., Minneapolis-Honeywell Regular Co.

▶▶▶ THERMOCOUPLES are used in thousands of applications for the measurement of temperatures ranging from subzero to upwards of 3,000 Fahr., but the basic principles and theories governing their operation are seldom completely understood by many industrial users. In this article, several fundamental thermocouple phenomena are discussed and interpreted from the standpoints of their practical application.

In itself, the thermocouple is a very simple device comprising two lengths of wire, made from different homogeneous metals and connected at both ends so as to form a complete electric circuit. Such a circuit will develop an electromotive force (emf) when the junction of the two wires constituting one end of the circuit is at a different temperature from the junction at the other end of the circuit.

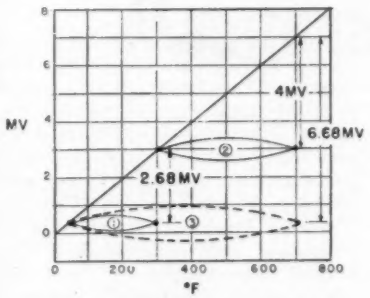


Fig. 1—Law of intermediate temperatures

Basically, this emf is dependent upon (1) the difference in temperature between the hotter junction (commonly termed the "hot junction") and the cooler junction (commonly termed the "cold junction") and (2) the metallurgical composition of the two wires used. However, various thermoelectric factors and laws affect both the development and utilization of the emf produced.

Peltier and Thomson Effects

The electromotive force developed in a thermoelectric circuit is ascribed to two phenomena, one known as the Peltier effect, the other as the Thomson effect. The Peltier effect is the emf resulting solely from the *contact* of two dissimilar metals. (However, its magnitude varies with the temperature at the point of contact.) The emf resulting from the less predominate Thomson effect is that produced by a temperature gradient along an element.

Since there are two points of contact, and two elements with temperature gradients, it follows that there are two Peltier emfs and two Thomson emfs. The net emf acting in the circuit is the resultant of all. The polarity of the net emf is determined by the particular materials used, and the relationship of the temperatures at the two junctions. The electromotive force can be evaluated by connecting a potentiometer, or other instrument for measuring emf, into the circuit at any point. Commercial thermocouples generate on the order of 20 to 50 millivolts (thousandths of a volt) through the range of their ordinary operating temperatures.

It can be shown that the net emf is a function only of the temperature difference between the two junctions and the kinds of material used. If the temperature at one junction (i.e. the cold junction) is maintained constant, or if variations in its temperature are compensated, the net emf developed is then a function of the temperature of the other junction (i.e. the hot junction). Thus, the net emf can be used as a measure of the temperature at the other junction.

There are two laws of thermoelectricity which are of particular interest from both the standpoints of operating theory and from that of practical pyrometer application. They are known as the Law of Intermediate Temperatures and the Law of Intermediate Metals.

Law of Intermediate Temperatures

In the majority of pyrometric installations, it is not practical to maintain one junction (usually referred to as the reference, or cold junction) at a constant temperature. Hence, some means must be provided to alter the emf developed under existing conditions to a value equivalent to that which would be generated with the reference junction maintained at a standard temperature, usually 32 Fahr.

The Law of Intermediate Temperatures provides a means for relating the emf generated by a thermocouple under ordinary conditions to a standardized constant temperature. In effect, the law states that the sum of the emfs generated by two thermocouples, one with its junctions at 32 Fahr. and some reference temperature, the other with its junctions at the same reference temperature and the measured temperature, is equivalent to that produced by a *single* thermocouple with its junctions at 32 Fahr. and the measured temperature. This is represented graphically in Figure 1.

From the preceding, it is evident that by adding an emf equal to that produced by the thermocouple with its junctions at 32 Fahr. and the reference temperature, a total emf equivalent to that generated by the hypothetical thermocouple with its cold junction at

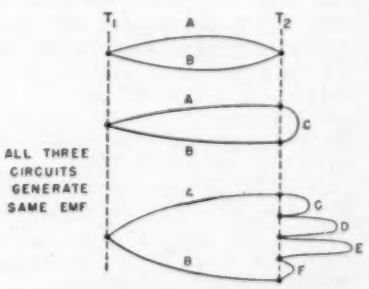


Fig. 2—Law of intermediate metals

32 Fahr. results. In most pyrometers, this is accomplished by the use of a temperature sensitive resistor which measures the variations in reference temperature (i.e. variations of the temperature at the cold junction caused by ambient conditions) and automatically provides the necessary emf by means of a voltage drop produced across it. Thus, the instrument calibration becomes independent of reference temperature variations.

Law of Intermediate Metals

In applying thermocouples, it is usually necessary to introduce additional metals into the circuit. Such is the case when an instrument is used to measure the emf, when the junction is soldered or welded together, and so forth. Copper, manganin, lead, tin and nickel may be introduced. At first thought, it might be expected that the introduction of additional metals would modify the emf developed by the

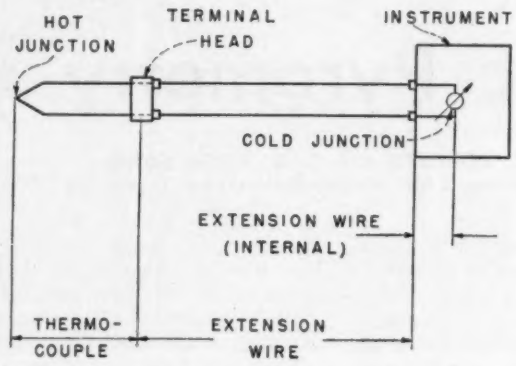


Fig. 3—Elementary thermoelectric pyrometer system

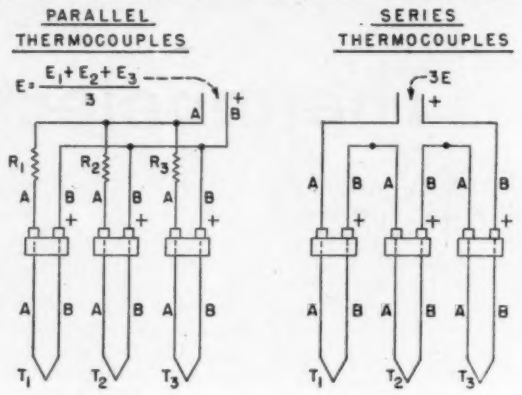


Fig. 5—Measurement of average temperatures

thermocouple, and destroy its calibration. However, the Law of Intermediate Metals states that the introduction of a third metal will have no effect upon the emf generated so long as the junctions of this third metal with the other two are at the *same* temperature. Additionally, any number of different metals can be introduced providing all the junctions are at the same temperature. Thus, in Figure 2, the three circuits shown all generate the same electromotive force, in spite of the fact that the second circuit diagram shows material "C," "D," "E," and "F" inserted between "A" and "B." In practice, this means that if the temperature inside an instrument containing a number of different metals in the thermoelectric circuit is maintained uniform, the net emf generated by metals "A" and "B" in the thermocouple itself will be unaffected.

Figure 3 diagramatically represents an elementary thermoelectric pyrometer system. In practice, the instrument is generally located remotely from the point at which the temperature is to be measured. It may be a few feet away or several hundred feet.

It is axiomatic that, "Where there is a hot junction, there is always a cold or reference junction." This fact always must be considered. As previously stated, it is thus necessary to either take into consideration the cold junction temperature and correct for it (if it is not equivalent to the reference temperature), or provide some means of compensation.

Since this means can be most conveniently located in the instrument as a part of its circuit, it is necessary to locate the reference junction inside the instrument. Therefore, the thermoelectric circuit must be extended from the hot junction, which is located at the point where the temperature measurement is desired, to the reference junction in the instrument.

Because the thermocouple assembly is exposed to elevated temperatures and adverse atmospheric conditions, it is an expendable unit and must be replaced periodically. To facilitate this, a terminal head is almost always supplied to which interconnecting wires (known as extension wire) between the thermocouple assembly and the instrument are connected. Since these wires are in the thermoelectric circuit, they must be made of the same thermoelectric material used in the thermocouple assembly (or materials having essentially the same temperature emf curve).

As the actual cold junction is located inside the instrument, internal extension wires of these same materials must be used between the instrument terminals and the cold junction. In effect, there are three thermocouples in the circuit; one in the thermocouple assembly, one in the external extension wire, and one in the internal extension wire. The actual temperature at the terminal head and at the terminals of the instrument is of no consequence, since by the Law of Intermediate Temperatures the net effect of the three thermocouples is the same as if one thermocouple ran from the hot junction to the cold junction. These three components of the thermoelectric circuit are usually present on all installations.

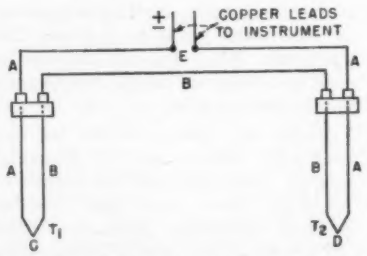


Fig. 4—Measurement of differential temperatures

Differential Temperature Measurements

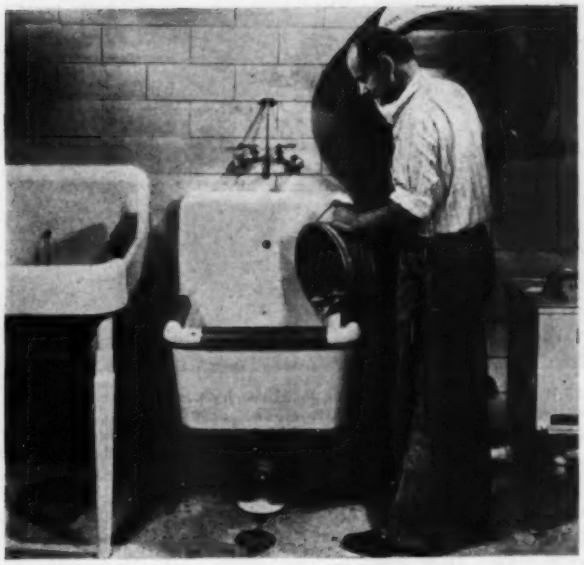
It is noteworthy that thermocouples can be used for temperature measurements other than at a single specific point. Consideration shows that several variations in the use of interconnected thermocouples are feasible. Two of these find ready application in the measurement of average and differential temperatures.

Since the thermocouple by its very nature develops an emf which is a function of temperature difference, it is readily applied to the measurement of the differential temperatures which are encountered in many industrial processes, such as in the checker work of open hearth furnaces. Figure 4 illustrates a practical arrangement for measuring such temperatures. Two similar thermocouples "C" and "D" are connected together with extension wire of the same materials as those used in the thermocouples. The connections are made in such a way that the electromotive forces developed *oppose* each other. At Point "E" two copper leads are run to the instrument. It is apparent that this circuit is essentially the same as an elementary thermocouple circuit. Thus, the electromotive force developed at "E" will be proportional to the difference between the temperatures T_1 and T_2. Copper leads to the instrument can be used if the junctions of extension wire material *A* and the copper leads are located so that their temperatures are always equal.

Average Temperature Measurement

In some applications it is desirable to measure the average temperature in large ducts or other apparatus. Thermocouples lend themselves readily to such measurements, since they can be con-

(Turn to page 463)



LEFT—Washrooms used daily by a large number of persons are not as likely to be abused if kept as spotless as this one. . . . RIGHT—Protective metal edgings lengthen the life of utility sinks

Maintenance in Plant Washrooms

RICHARD IRMITER
Crane Co.

▸▸▸ PLUMBING FIXTURES are tough! They will stand up under a lot of hard usage and still remain smooth and beautiful for a lifetime. But we must remember there is a limit to the abuse they will take. Toilets and lavatories weren't made to stand on, to use as anvils, to act as garbage cans, work benches, or tables. They should be treated kindly and should be kept in repair and cleaned often, for cleanliness is the most effective check to ill treatment of fixtures.

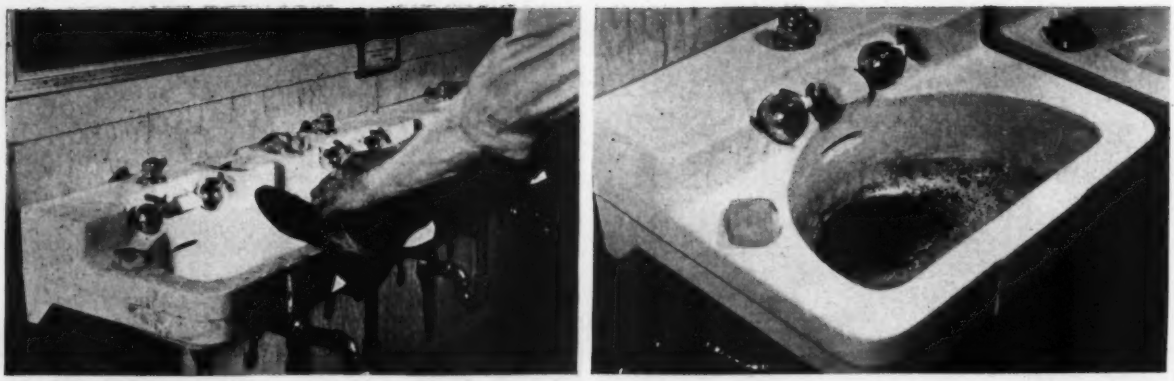
There are definite procedures that should be followed in cleaning and maintenance of industrial washrooms. It should be remembered that maintenance is a constant problem in such installations. Industrial plumbing fixtures are subjected to a hundred times the usage and abuse that home plumbing fixtures have to undergo. A faucet on a home lavatory may be turned on and off only a dozen times a day. In a busy plant washroom a faucet may be turned on and off at intervals of a few minutes all day long—and all night long too, if the plant operates on extra shifts. And many people seem to delight in ill treatment of semipublic or public plumbing. Abuses that are taboo in the home appear to be accepted sport in the plant washroom by some. They leave the water running; they wrench the faucet handles so tightly that the stems are twisted and seat washers are cut through in just a few shut-offs; they throw cigars, cigarettes and wastepaper in the wash basins and urinals; they plug up toilet bowls with orange rinds and with lunch bags full of garbage; they sit on the edges of wash basins until the basins tear loose from the walls; and they put their feet on toilet seats or the edges of lavatories in order to wipe off their shoes.

Such inadvertent vandalism is almost impossible to control. Policing the washrooms creates ill will and can lead to more and deliberate vandalism. Much of the effect of carelessness can be overcome by a regular maintenance program. For instance, if leaky faucets are repaired as fast as leaks develop, the bad habit of turning the handles off too tightly needn't develop at all, for the water always shuts off when the valve is lightly closed, as it should be.

A dripping faucet not only means accelerated wear on the mechanism, but large water losses. A steady dripping will waste more than 24 gallons of water a day—almost 9,000 gallons a year. If a large number of faucets are dripping, extra water costs can be considerable. Moreover, if a leak gets so bad that a stream of water as small as an eighth of an inch in diameter is running, it will only take about three days to waste 9,000 gallons—that's over a million gallons a year thrown away from a single faucet! Add up the losses from even a half dozen faucets leaking a one-eighth-inch stream all day and all night long and you really have a water bill!

A regular cleaning program is important. In the home it may be sufficient to scour the plumbing fixtures and trim once or twice a week, but not in a washroom used by dozens or hundreds of people daily. Here a daily cleanup is a minimum requirement. In a washroom where traffic is heavy, two or more cleanups per day may be necessary. Such a planned cleanliness program engenders a greater feeling of respect for the equipment among users. A man is not nearly as likely to put a hobnailed shoe up on a lavatory rim to tie his shoe laces when the lavatory is sparkling clean as he is when the lavatory is dirty with soap scum and drippings.

Here is something to remember in cleaning vitreous-china or porcelain-enamel plumbing fixtures. Fixtures can be abused in cleaning as well as in use. Most people don't realize that these gleaming white surfaces are vir-



LEFT—Dirty fixtures encourage abuse by plant personnel. This man might not have used the lavatory as a shoe-shine bench if the fixture had been spotlessly clean. . . . RIGHT—Be sure that drains are kept free flowing. If a lavatory drains off slowly, sediment in the water will be deposited on the sides of the bowl. Few users are patient enough to wait long enough to flush the sediment down

tually the same glass surfaces that make for quality in the finest mirror or window glass. How many scrub-up men would scour the washroom mirrors with a harsh cleanser, or pumice or sand? The thought makes you recoil? But we see it done every day to wash-basin surfaces—yes, we have even seen people use sand to scour washroom lavatory surfaces, which have every bit as fine a finish as an expensive plate-glass mirror.

Choose Good Cleansing Agent

Handle with care if you would have plumbing fixtures that are glistening and gleaming for their lifetime. If you would know whether the cleanser you use will scratch the surface, take two pieces of ordinary glass and put a bit of cleanser between them. If rubbing the pieces together produces scratches on the glass, there is abrasive material in the cleaning agent that will just as surely scratch your fixture surfaces. Tiny scratches, to be sure, hardly noticeable, but continued use of the cleanser will add more and more of the tiny scratches until the glistening finish has been destroyed. Don't be fooled by certain "fast" cleaning agents that derive their cleaning abilities from harsh and crude abrasives. Once the gloss is gone, the surface will be hard to clean, for dirt will become imbedded in the tiny scratches and will defy attempts at removal.

Treat fixtures with care in cleaning, and cleaning will always be easy, instead of becoming progressively harder. You have never seen a window that required "elbow grease" to clean. A little soap and water will remove the most stubborn dirt from a window. The same is true of plumbing fixtures. Stains and dried grease accumulations *do not have to be scoured away with abrasives.* For a particularly stubborn bit of grime, attack the surface with a generous amount of hot water and a stiff bristle brush. Use plenty of soap to remove grease. Certain cleansers are satisfactory, but don't use a cleanser without first giving it the "glass test" between two pieces of glass. If the glass scratches, don't use this cleanser on your plumbing fixtures. If there is no sign of a scratch on the test glass, the cleanser is fine for this use.

Bear in mind that regular cleaning daily, or oftener, makes surfaces easier to clean. Don't give the dirt a chance to get set so that heavy scouring is necessary.

Abusive habits of the cleaning personnel can be the cause of marred fixtures. Scrub-buckets are a major cause of marring on fixture surfaces. Cleaning personnel slams a bucket down on a toilet rim in order to empty the bucket. Or a bucket is carelessly scraped around in the bottom of a utility sink. The inevitable grinding and scraping produces scratches on the surface. Such a practice should be avoided. Rubber mats are available for protection of sink bottoms, and sink rims can be equipped with metal shields to prevent buckets and cleaning tools from marring the rims. Toilets should not be used for dumping buckets if utility sinks are provided for the cleaning personnel.

Keeping drains in condition is another important part of plumbing fixture maintenance. When any fixture runs off slowly, it should be given immediate attention. Slow run-off not only causes wasted time and exasperation for the user of the fixture, but it increases the dirt accumulation on the fixture. Slow run-off is unsanitary. The old standby, the "plumber's friend," the rubber suction plunger, should be on hand at all times, for if quick action is taken with this tool whenever a lavatory or sink plugs up, the difficulty can usually be cleared up quickly. Stop-ups can be avoided almost entirely if all fixture drains are treated monthly with a good caustic lye solvent compound. Never allow the solvent to remain in the bowl. Always flush down any surplus into the trap immediately. If directions are followed carefully, no harm can come to the fixture from use of this material. If drains are allowed to become badly clogged from lack of proper maintenance, it may be necessary to disassemble traps entirely to clear up a clogged condition or to use a special plumber's drain cleaner to reach the clogged area. If a slow-acting drain is not treated immediately, the clogged condition may extend into the piping for some distance beyond the trap because the slow movement of the water allows solids to settle out. Eventually the condition may become so bad that it is necessary to tear out walls and piping.

Clean Fixtures Stay Bright

If fixtures are frequently and thoroughly cleaned, the surfaces will remain bright and glistening. If cleaning is neglected, however, certain substances may build up what appear to be stains on the surface, especially in areas that have mineral-bearing waters. If the fixture is of an acid-resisting material (all vitreous china is acid resisting; certain enameled iron fixtures are acid resisting, and will be so marked or initialed), a mild acid solution may be used to remove the surface accumulation. An oxalic acid solution of 5 per cent strength can be swabbed over the affected surface, then rinsed off with clear water when the stain has dissolved. If the accumulation is extremely bad, a 10 per cent solution of muriatic acid should be used. Use rubber gloves when applying this solution and take care not to leave the acid on chromium parts, for the acid will corrode the chromium if allowed to stand.

Drinking fountains, too, come in for their share of troubles. On a hot day

the valve on a drinking fountain may be opened and closed more often than any other valve in the building. Sometimes drinking fountain valves or handles stick, leaving the water running. Sometimes closing springs break. Such troubles should be corrected immediately, for water wastage can be tremendous with constant-running drinking fountains. A stuck fountain is usually running at virtually full flow.

Another common trouble of drinking fountains is poorly adjusted flow control. Most modern drinking fountains have an automatic stream regulator, but there are a few installations that do not have this device. It is almost impossible to control flow properly without the regulator, for no matter how carefully the original flow setting is made, variations in water pressure are bound to occur, with the result that the stream is merely a dribble at times, and at other times shoots clear of the bowl onto the floor. The automatic stream regulator corrects this tendency by automatically increasing flow when pressure is low and automatically decreasing flow when pressure rises. It is recommended that such a device be installed where a drinking fountain is not already so equipped.

Even with automatic stream regulation, however, the regulator setting should be checked from time to time, for wear within the mechanism can change the flow. Most regulators are the rubber diaphragm type, and in time the diaphragm may need to be changed. Valve seats and rings need repair periodically just as in any standard faucet. Abuse of the mechanism frequently results where stream flow is not kept normal. If the flow is not adequate, exasperated users will try to turn the valve handle beyond its normal stopping point, and some may succeed, damaging the mechanism. Some become angry and kick or hammer the handle or tamper with the bubbler. If flow is too strong, funsters take delight in seeing how far beyond the bowl they can squirt water, with the resultant mess and floor-slip hazard.

Care of plumbing is not complicated or difficult. Any cleaning staff can be taught quickly the necessary procedures of regular maintenance. Most important is the establishment of a definite program to keep the sanitary plumbing equipment working and looking its best at all times. If this is done faithfully, the equipment will last and retain its beauty for the life of the building.

Thermoelectric Pyrometry

(Continued from page 460)

nected either in parallel, or in series, the same manner as primary cells are interconnected. In Figure 5, typical parallel and series thermocouple circuits are shown. The left hand diagram shows a parallel circuit. Here, the electromotive force developed at "E" is the average of that developed by the three thermocouples shown. To obtain a true average, the temperature-emf curves of the three thermocouples must be linear, which is seldom the case in actual practice. However, this condition is approximated closely enough for most purposes. Since current will circulate among the three thermocouples, when the temperatures T_1, T_2 and T_3 are not equal, the resistance in each individual thermocouple circuit beyond the point of parallel connection must be equalized by swamping resistors R_1, R_2 and R_3. This is because the voltage at "E" is the average of the potential drops across each individual branch of the circuit rather than an average of the electromotive forces. Since the resistance of the actual thermocouple will also vary with its temperature, the effect of this variation must be minimized by making the values of R_1, R_2 and R_3 high in comparison to the change in resistance that is encountered.

Parallel connection of thermocouples for average temperature measurement is advantageous in that the instrument calibration can be the same as that for a single thermocouple. On the other hand, a disadvantage lies in the fact that if any one of the thermocouples burns out, the fact is not readily apparent.

The diagram at the right of Figure 5 shows the series connection for averaging temperatures. Here each of the thermocouples is connected in series with the others using the correct extension wire materials. Where three thermocouples are used the electromotive force developed at "E" is approximately three times that developed by one of the thermocouples. In this arrangement, the instrument calibration does the averaging. If a null balance type of instrument is used to measure the emf, it is not necessary to equalize the resistance in each branch of the circuit, as in the case of the parallel connections. However, the extension wires from *each* thermocouple must be extended back to the actual cold junction at the instrument if precise results are desired. Instruments used with this type of circuit must be calibrated for three times the emf of one thermocouple, assuming that three thermocouples are used. Obviously, in this arrangement, if one thermocouple burns out, the condition is immediately apparent, since the electromotive force at "E" disappears. This can be advantageous in many installations.

The series thermocouple circuit is also frequently used to obtain greater emf output or more sensitivity with a given instrument when very small temperature changes need to be measured. In addition, the series connection is also used in what is known as a thermopile, employed in such devices as radiation pyrometers. In such a device, the amount of radiant energy reaching the junctions of the thermocouples is very small. Therefore, some means for increasing its effect is needed.

In using either the parallel or series type of averaging circuits, care must be exercised to avoid grounded hot junctions, since such grounds will result in circulating currents between the individual thermocouples. These will adversely affect the emf appearing at the instrument connections.

In conclusion, it should be stated that the foregoing discussion is meant to cover only certain electrical aspects of thermoelectric pyrometry in relation to theory and application. Insofar as the physical and metallurgical aspects of sundry applications are concerned, no effort has been made to include them within the scope of this article. Nor has any effort been made to include such considerations as calibration stability, utility of various kinds of thermocouples and so forth. Suffice it to say that these aspects, in themselves, entail a discussion of equal if not greater scope.

Foremen's Contest Improves Operation

Results of Contest: Increased Efficiencies, Better Supervision, and a Reduction in Costs

J. W. KUEBLER
Plant Superintendent
Dixie Cup Company (Easton, Pa.)

▶▶▶ A MAJOR PROBLEM—that of keeping supervisors well informed—came up for consideration about six years ago at the Dixie Cup Company's Easton (Pa.) plant.

After a complete study of the subject, the practice of holding monthly Foremen's meetings was instituted. At these meetings, formal reports are presented on the following subjects: Safety, Labor Turnover, Production, Waste Control, Customer Complaints, and Costs. Several years ago, an attempt was made not only to dramatize the importance of bettering these various functions, but also to set up a means of competition which would influence the foremen and supervisors involved to turn in better performances and award them for doing so.

The medium decided upon was a Foremen's Contest. This contest has been in existence for the past four years and has worked out very satisfactorily. For example, costs for 1946 were 1.62 per cent under budget figures, against the 1945 standing of .15 per cent over budget figures, and this trend has continued. The safety record for 1946 also showed an improvement which was attributable to the contest; accidents for the year numbered 103 as against 135 in 1945. Days lost were 148 in 1946 compared with 304 in 1945. Nine suggestions by foremen involving machine changes netted savings of over $7,000. This compares with previous years when at the most one or two noteworthy suggestions were received.

It is believed that this type of contest could be used by any paper converting company or, for that matter, it is general and could be used by practically any manufacturing company that keeps complete records measuring the functions outlined in the contest.

The contest is based on eight management subjects: Housekeeping, Safety, New Ideas, Customer Complaints, Turnover Control, Waste, Production, and Costs. Each contest runs from February through November. During those months 40 foremen from 14 departments are rated. Ratings are based on standards publicized at the start of the contest.

Awards are made at the annual foremen's Christmas party. Large denomination savings bonds are given to those having the highest ratings for the 10-month period.

Actually, the contest is run in two divisions. One for direct manufacturing departments; one for major indirect departments.

To tie the contest right down to daily operation, foremen receive reports on each of the contest points during each monthly meeting. Problems are brought to the front by foremen who seek their solution. Members of top management attend the meetings to give operational reports and to tackle common problems with the foremen. At the end of each meeting, foremen have an excellent picture of the company's current operating condition.

So that nothing will be left to memory, minutes of each meeting are given to foremen and members of top management. These minutes are complete, but brief, and give monthly and cumulative contest scores for all departments.

The rating is done as follows. It should be noted that scoring factors have been modified on occasion to fit conditions.

Maintenance is typical of "Indirect" Departments. . . . (For scoring purposes)

Plant Maintenance Department—Contest Scoring

Measure	*Points*
1. Housekeeping	10
2. Safety	10
3. New Ideas	10
4. Costs	10
5. Projects and other work	10
Total	50

1. *Housekeeping*—A committee consisting of the superintendent, production manager, personnel director, and traffic manager will review each department frequently during the month and rate the department for housekeeping. Cleanliness of floor, location of material in its proper place, careful storage, maintenance of machinery, appearance of workers will be observed and the rating based on the observation. During the tour, each member of the committee will credit his own grade to the department and an arithmetical average of all ratings will determine the point allowance.

2. *Safety*—If the entire month is passed without a lost-time accident, the full credit of 10 points will be awarded. For each lost-time accident, 2 points will be deducted from the allowable 10. For each accident requiring medical attention, 1 point will be deducted from the allowable 10.

(Because of the number of employees represented in plant maintenance, and further because of the hazardous operations, for each consecutive month without a lost-time accident an additional ½ point will be added to the total.)

3. *New Ideas*—A major suggestion involving a saving of more than $500 per year will be given the full credit of 10 points. Other acceptable suggestions will be graded in proportion to their importance or savings. For instance, a saving of $100—2 points; $200—4 points, etc. Considering a minor suggestion where savings cannot be estimated, 2 points will be allowed.

4. *Costs*—If the overhead budget figure is met or bettered, 10 full points will be allowed. For each $500 or fraction under budget, one point will be added.

5. *Projects and other work*—The great bulk of the plant maintenance department work is the completion of projects and other major jobs assigned by the management. If all projects are completed on time and within the budget, the full 10 credits will be allowed. If all projects are not completed on time or within the budget, the proportion of the overtime and the amount over budget will determine the points to be deducted.

Lid Production is typical of "Direct" Departments. . . . (For scoring purposes)

Lid Department—Contest Scoring

Measure	*Points*
1. Housekeeping	10
2. Safety	10
3. New Ideas	10
4. Customer Complaints	10
5. Turnover Control	5
6. Waste	15
7. Production	10
8a. Overhead	15
8b. Labor and Material	15
Total	100

(Turn to Page 468)

STOCK CONTROL RECORD									
PART NAME STARTER COIL		PART NO. 1732X5			USED ON ½ TO 5 T. CRANES NO. 1232, 1561, 1622, 1763, 1937			RECORDER POINT 5	
SUPPLIER SQUARE D					PRICE EACH $2.95 IN LOT OF 10 DELIVERY TIME 2-3 WEEKS			STOCK LOCATION 7-H-3	
DATE	QTY.	MACH. NO.	REQN. NO.	INVENTORY	DATE	QTY.	MACH. NO.	REQN. NO.	INVENTORY
7/20	10	—	17632	0					
8/6	10	—	"	10					
8/7	1	1763	—	9					
8/27	1	1931	—	8					
9/6	1	1232	—	7					
10/2	1	1561	—						
10/17	1	1232	—						
10/17	10	—							
11/2	10	—							

Effective record must be maintained if a maintenance stocking program is to succeed. Typical stock control form, shown, gives pertinent ordering and stocking information such as recorder time, stock location, use of parts, etc.

Downtime Reduced Through Stocking Motor Renewal Parts

WILLIAM G. HALL
Manager, Renewal Parts Dept.
Reliance Electric & Engineering Co.

▸▸▸ AS PRACTICAL MEANS of maintaining peak production through the minimization of equipment breakdowns caused by electric motor failures, systematic maintenance has increasingly demonstrated its economic values in the paper industry and others during recent years. As a result, such measures as periodic check-ups and proper lubrication are now universally established as good motor maintenance practice.

Today, with mechanization of pulp-and-paper processing lines continuing at an accelerated pace, the concept of stocking adequate replacements—either complete "spare" units or essential components—for motors driving vital production equipment is rapidly commanding greater attention in mill management and maintenance thinking. It is a logical corollary to the precept of systematizing essential maintenance work.

In a growing number of mills, the ready availability of complete replacement units or integral parts when and where needed spells "production insurance" by increasing maintenance efficiency and decreasing equipment downtime, thus reducing the frequency of work stoppages due to machine failure. Experience further indicates that a sound replacement program, formulated in terms of the individual mill's motor usage requirements, frequently proves a profitable investment in that it establishes a wide margin of "production protection"—and "insurance policy," if you please—against crippling work stoppages or costly interruptions caused by mechanical troubles. Many dividends are obtained.

Why Stock Motor Parts?

Stocking of an adequate replacement parts supply appreciably increases the economic values of motor maintenance. Equipment downtime is substantially reduced; its production time and cost losses are correspondingly lowered. Replacements or repairs can be made quickly as needed when trouble occurs, enabling a machine to be put back into productive service with the least delay. A continuous maintenance cycle with unit replacement as the cornerstone can be set up, making trouble-shooting *in advance* completely practical. Performed on a regular time schedule, maintenance so scheduled can go a long way towards further limiting out-of-service losses entailed by operational failures.

In other words, put essential mill and equipment maintenance on a regular timetable — a systematic schedule carried out periodically — and the chances are better than ever that you can chop down the severity and frequency of out-of-service losses arising from operating failures.

To put it still another way, this electric motor replacement parts stocking

ECONOMIC FACTORS ON STOCKING MOTOR RENEWAL PARTS

FOR—

(1) Keeping downtime of production equipment at a minimum.
(2) Promoting better repair work by enabling job to be handled at more convenient intervals, reducing overtime in repair department.
(3) Greater protection of production schedules.
(4) Higher employee efficiency by minimizing disruptions due to mechanical trouble.
(5) More positive insurance against costly interruptions due to parts failure.
(6) Speedier unit replacement or parts repair.
(7) Expediting performance of good maintenance on a continuous cycle, thereby promoting maximum economy through reduction of out-of-service losses.
(8) Stocking of complete unit assemblies for interchangeable machines on critical production equipment to reduce delays caused by breakdowns.
(9) Availability of parts or complete spares when and where needed.
(10) When cost of equipment downtime and production losses exceed cost of stocking parts.

AGAINST—

(1) Limited amount of production equipment in use.
(2) High investment in inventory of complete unit assemblies or loss in essential spare parts.
(3) Setting up and maintaining proper stock control system.
(4) Low factor of machine outage.
(5) Adequate stocks maintained and prompt delivery service provided by source of supply.
(6) Lack of sufficient storage space, which is now at a premium in many mills.
(7) When cost of stocking parts exceeds cost of equipment downtime and production losses.

idea, you might say, represents the latest, ultimate refinement in practice of that hardy perennial among maintenance axioms, "an ounce of prevention is worth a pound of cure." As the Renewal Parts Section of the National Electrical Manufacturers' Association says: "The wise user knows from experience that certain parts are going to wear or burn out, and in self-protection, he will carry limited stocks on his own premises"!

How Much Protection Do You Want?

Before further analyzing this concept of protective parts stocking by motor users, it should be emphasized that no hard and fast rules can be made covering the particular types or specific quantities of parts that should be stocked and which have equal application in all cases. Purchasing repair parts for stock is much like buying insurance. In the final analysis, the desirability and justification of stocking repair parts, and the quantities to carry, basically depend on how certain primary questions are answered. For example, how expensive is machine outage to you? Just how much insurance against equipment downtime do you want—100 per cent . . . 50 per cent . . . or 10 per cent?

The relative degree of protection against motor failure desired, in terms of probable outage losses based on past experience, must be decided first; and when you have definitely ascertained that, then is it practical to formulate and institute a replacement parts program specifically designed and calculated to meet the particular maintenance requirements imposed by actual machine usage in your mill.

There are, of course, several supplementary factors related to the problem that likewise deserve careful study in weighing the advisability of a spare parts stocking program. These include, among others, such considerations as:

Supplementary Considerations Entering Into Problem

(1) Relative importance of individual machines or groups of related units, from total usage and stoppage standpoints, to overall plant production

(2) Special-purpose equipment used in processing

(3) Initial cost of equipment and investment required for stocking replacement parts

(4) Stocks maintained and delivery service provided by suppliers

(5) Storage space available for spare parts at point of use

These conditions, quite obviously, vary widely from one mill to the next; hence, no two situations are exactly alike or comparable. Repair parts and quantities stocked by one mill may easily fall far short of satisfying the maintenance requirements of another. Again, one mill's stock may represent an excessive inventory and investment for another.

Thus the problem, basically, is one of weighing the advisability and balancing the cost of stocking repair parts against the loss incurred through downtime of equipment. Where past experience indicates that cost of the latter exceeds that of the former consideration, then an extensive replacement parts program is more than justified on an actual dollar-and-cents basis. But where equipment is not of paramount concern to production volume and continuity and where machine loading can be rescheduled to other available units when trouble develops, then replacement items generally can be ordered as needed from the motor manufacturer, making quantity stocking of repair parts unnecessary. In such instances, only key components for special machines need be carried, and then only in minimum quantity for economy's sake.

Still, there is no denying the soundness of the philosophy behind the replacement stocking concept, for the availability of supply stocks of precision-built, factory-quality renewal parts when and where needed tends to shorten equipment downtime and to expedite the job of putting units quickly back into production. Reliance, like other forward-looking motor manufacturers, has long promulgated this maintenance doctrine among the many mills using its a-c and d-c motors, motor-generator sets, all-electric adjustable-speed V*S drives, and other specialized electrical equipment.

How Atmospheric Conditions Affect Stocking

It is not possible to give specific quantitative ratios of stocking repair parts to equipment units in service since operating conditions and related factors vary so widely among different mills. However, some general observations based on accumulated mill experience and which importantly influence the need of maintaining a replacement parts supply in most mills can be made.

Corrosion, abrasive dust, and high room temperature are, in that order, the chief atmospheric conditions associated with mill motor applications most likely to cause the need for an adequate motor parts replacement program. Corrosive fumes may cause premature motor failures or excessive "wear and tear." A corrosive atmosphere normally affects standard insulated motors more than Class B or high-temperature insulated motors.

High room temperature causes a hotter-running motor. For example, take motors rated 10 hp at 40 C. rise above surrounding room temperature. If the motor is operating near paper-drying ovens and similar equipment, the insulation is being used at a higher temperature. Insulation life on standard motors is affected by the actual temperature reached within the motor. Above 90 C, Class A insulation life is cut in half for every 10 degree increase in temperature. Assuming the average life of Class A motor windings at 90 C, is 20 years, this means that at 100 C, the average life of windings is 10 years; at 110 C, five years, and so on.

Three General Application Factors Involved

Excluding atmospheric conditions, there are three applications which generally are hardest on electric motors. These are:

(1) Overloading—which results in high motor temperature. While a motor may be rated 10 hp, say, it will carry considerable overload without giving any visual sign of such an overload. Nevertheless, the motor becomes hotter than it should—a condition that, if continued over a period of time, eventually leads to failure of stator coils and rotors in the case of a-c motors and field coils and armatures on d-c motors.

(2) The equivalent of an overload, caused by excessive starting and stopping. Since a single start demands a great current inrush, it produces more heat than when the motor operates normally. Plug reversing and dynamic braking also produce heat.

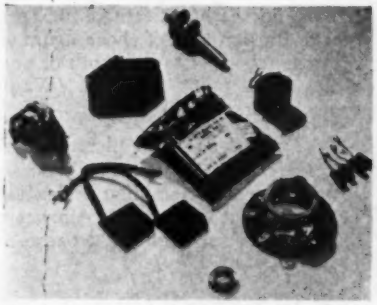
(3) Lack of a regular maintenance schedule based on plant experience. Because of dirt and wear factors, good maintenance is essential in all cases. When motors operate under dirty conditions and no suitable provision is made for periodically cleaning the units, wear of moving parts increases appreciably. And not to be overlooked is the additional fact that dirt which has accumulated on motor frames and windings prevents proper cooling of coils, causing them to run at above normal temperatures. This, in turn, shortens winding life.

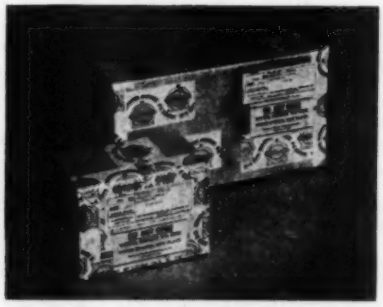
What Parts Require Replacement?

Windings and moving parts subject to wear require replacement more frequently than other components. Bearings on a-c motors and bearings and brushes on d-c motors are typical examples. Of course, other parts susceptible to damage from any other source also may require replacement occasionally.

This class includes such parts as

For protection and visibility of product and its easy identification by the user, small renewal motor parts may be packaged in moisture-proof, transparent cellophane bags which are then packed in folding boxes or corrugated cartons for shipment





LEFT—Safeguarding motor parts against possible corrosive deterioration in storage at the user's plant calls for protective packaging by the manufacturer. Since the identification ticket giving part number, name, and quantity is plainly visible, package need not be opened until parts are actually required for use. . . . RIGHT—Coils and certain other motor parts subject to deterioration upon exposure or damage in handling are packaged and shipped in mailable, folding boxes or corrugated fiberboard cartons. Note sticker used to discourage opening of package immediately upon receipt by user. Packing list is fastened to outside of box at time of final wrapping

brush holders, for instance, which, although not considered as wearing parts, must be replaced from time to time. Accordingly, they are generally carried in mill maintenance departments having a good renewal parts stocking program. Still another common illustration of non-wearing parts susceptible to damage is a cracked bracket resulting from an intraplant trucker inadvertently bumping his vehicle into a motor.

Minimum Basic Components to Stock

On parts of certain types requiring frequent replacement, the dollar investment is sufficiently small to warrant maintaining a complete stock. For motors up to approximately 5 hp installed in a single important equipment application where only one unit is available, a complete armature and shaft (for d-c motors) or a complete rotor and shaft assembly (for a-c motors) is suggested for that motor of the particular horsepower, voltage and speed rating involved. A typical stock of recommended spare parts for a d-c motor or generator would comprise this assortment:

1 set—armature coils or one complete wound armature with shaft
1 set—main field coils
1 set—intercoils
1 set—bearings
3 sets—brushes

Where four or five duplicate motors of the same manufacture are in service, one complete assortment of these particular elements is recommended for stocking. In cases where interchangeable motors are used to power critical machines, whose outage will create a log-jam in the production flow if not speedily restored to service, stocking of complete units for instant replacement is advised.

With larger motors (above 5 hp), investment in renewal spares mounts up and becomes a substantial expense item in the over-all maintenance budget. What type of parts to stock and how many to stock revert back to the relative degree of insurance against machine outage desired. Again, it's simply a matter of weighing the cost of parts against the time and money losses involved by equipment breakdowns.

Downtime is usually restricted to a minimum when you have a complete motor instantly available for replacement the moment trouble occurs. This relieves the pressure on the repair department to make a temporary repair by enabling the shop to take more time to repair the motor removed and do the job right at the very outset.

Cyclical Maintenance Often Practical

In mills where a complete stock of renewal parts is always available to meet all contingencies, rotational replacement by virtue of a continuous maintenance cycle frequently becomes practical. Motors can be removed, at regular intervals, in relays of, say, five at a time, and immediately replaced by cleaned and reconditioned units. The sequence is progressive, providing a circulating unit replacement program that assures having on hand a reserve stock of five motors fit for service at all times.

Such a set-up may not be practical in some mills, however, due to the limited types or number of motors in use. The next best bet, then, is to have available the proper replacement parts when needed.

Many mill maintenance departments are often called upon to exercise considerable ingenuity to keep equipment running for continuity of production. One frequent example is the replacement of a motor that operates at one speed and which has failed, with another unit operating at a different speed, adapting the latter to the speed requirements of the machine by effecting a suitable change in pulley ratios.

An Additional "Plus Value" of Replacement Stocking

Here again, another "plus value" of replacement stocking can be realized. On d-c motors, where speed can be varied readily by the use of suitable control equipment, this may be successfully accomplished without the necessity of changing pulley ratios. Replacement motors, of course, must be able to produce the horsepower required by the machine.

Protective Packaging of Parts for Storage

Safeguarding motor parts against corrosive deterioration in storage on the user's premises calls for protective packaging by the manufacturer. However, this purpose is often defeated in receiving departments where packages are torn open upon receipt to check the packing list.

At Reliance, multiple small parts—clamps, brush holders, frame-mounting units and bolts, heaters, connectors, coils, and the like—are packaged in moisture-proof transparent cellophane bags. Each parts package contains a ticket, easily visible, giving part number, name and quantity, so that the package need not be ripped open before use. Packing list is placed inside the mailable folding boxes or corrugated fiberboard cartons in which the plastic-packaged parts are shipped.

Large parts not suitable for moisture-proof packaging because of excessive cost and which have machined surfaces should be coated with a rust-preventive solution, wrapped with wax-impregnated waterproof paper, then tape-sealed securely to protect them against corrosion in storage or shipment. For handling and storing parts received from manufacturers who do not ship their products in moisture-proof packages, it is good practice to have facilities available at the mill to wrap them in this manner upon receipt. If parts with machined finishes are received which have not been suitably "rust-proofed," they should be dip-coated with a quick-drying, non-oxidizing solution prior to stocking.

In any renewal motor parts stocking plan, proper parts records play an important role. As vital guides to sound maintenance practice and specific requirements of the particular mill, such records should show: supplier's name and address; identification of parts by name and name plate data; location in stock; number of machines to which part is applicable, a fact which affects quantity to be stocked; usage; price data to take advantage of quantity discounts where applicable, and minimum stock level to serve as a re-order signal.

Foremen's Contest . . . . . .

(Continued from page 464)

1. *Housekeeping*—Same as maintenance department

2. *Safety*—Same as maintenance department

3. *New Ideas*—Same as maintenance department

4. *Customer Complaints* — For each complaint received from customers involving lid production, 1 point deducted (exclusive of training defects)

5. *Turnover Control*—If the department is below plant average, full credit allowed. If above, 1 point deducted for each point above average. (Uncontrollable losses not included.)

6. *Waste*—If the department's average for the previous month is lowered, 7.5 points will be allowed. In addition, 7.5 points awarded if percentage for same month of previous year is bettered. For each increase of 0.5 per cent or fraction thereof above figure of previous month or same month of previous year, 1 point deducted. (Waste control figures used.)

7. *Production*—If the planning estimates are met, 10 points will be allowed. For each 1 million or fraction below, 1 point deducted. (Allowance will be made for planning department changes.)

8a. *Overhead Costs*—If below budget figure, 15 points will be granted. For each cent of controllable expense over budget, 1 point deducted; but for each cent under budget, 1 point credited.

8b. *Labor and Material Costs*—Production per labor hours will be used in determining labor and material costs as set up in the labor distribution sheet. If production per hour equals or betters the previous month, 7.5 points will be awarded. If production equals or betters the same month of the previous year, an additional 7.5 points will be allowed. For each 5 per cent decrease from the figures of the previous month or same month of the previous year, 1 point deducted.

Probably the primary importance of this contest has been the interest indicated by the foremen and their sincere desire to become a contest winner. The monetary value received is apparently secondary to the recognition that they receive from Management for having placed first or second in their particular group. The foremen now come to the meetings well prepared for intelligent discussions and indications are that their departmental morale is at an all-time high.

Objectives of the N.R.S.B.

OLIVER M. PORTER*

▶▶▶ ON LEAVE OF ABSENCE from the U. S. Pulp Producers Association, I joined the staff of the NRSB on November 9, 1948, as a consultant on pulp, paper and paperboard in the Forest Products Division. . . . My assignment was the preparation of a plan for the industry's mobilization, in the event of war.

In order to get started on this job, we selected an Initial Task Group composed, for the most part, of executives from the industry who had been responsible for the WPB's activities in pulp, paper, and paperboard during the last war. Included in this Group were the presidents of the American Paper and Pulp Association and the National Paperboard Association. . . .

Our work with the NRSB was confined to the industry's raw materials and basic products—pulp, paper, and paperboard—and to such related matters as manpower, transportation, materials and equipment, control orders, etc. Yet to be covered are the converting and distribution branches of the industry, and the actual determination of probable essential military and civilian requirements for pulp, paper, and paperboard and their converted products.

Two other very important aspects of war mobilization planning will require further intensive work, which will necessitate the closest possible co-operation between the pulp, paper, and paper board industries of both the United States and Canada, and government agencies on both sides of the line, as follows:

1) The working out of detailed plans for a wartime continuing flow of logs, pulpwood, wood pulp, and woods labor from Canada to the United States.

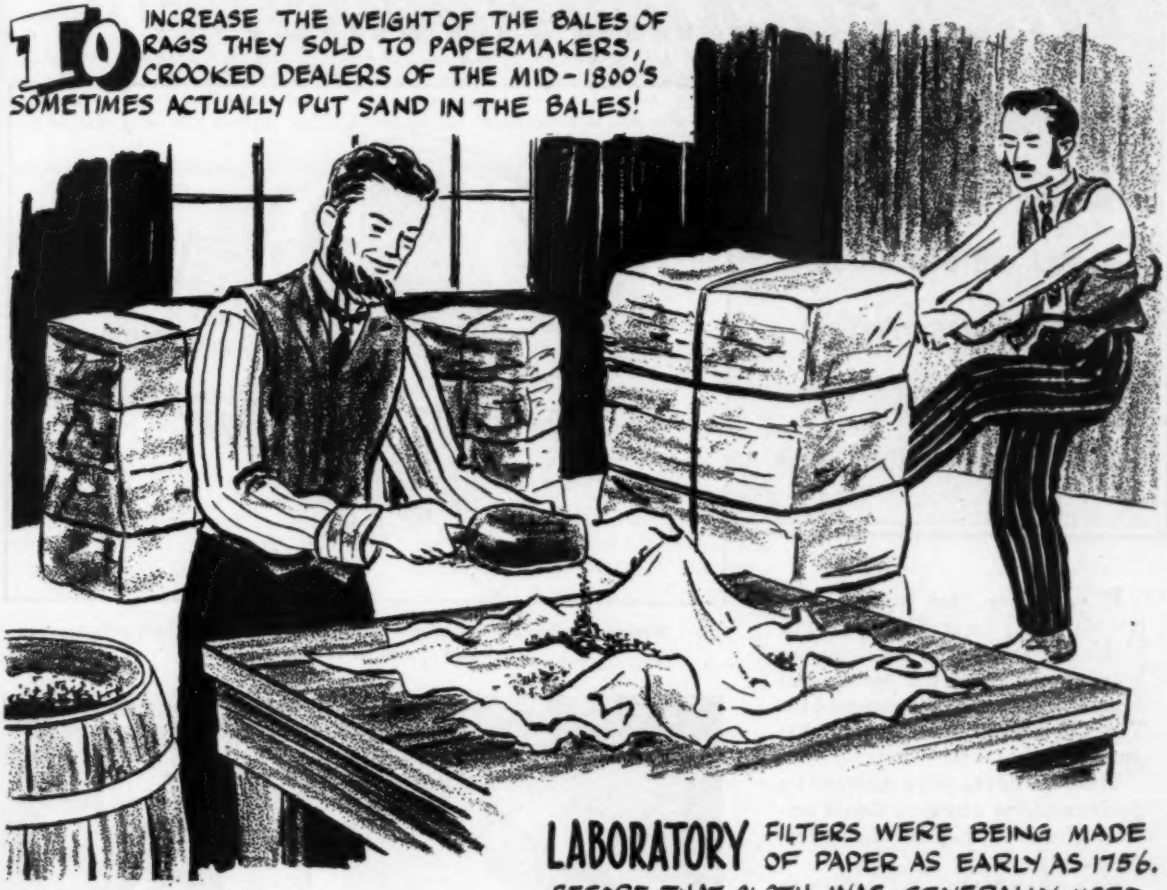
2) The effective integration of all aspects of a war mobilization plan for the pulp, paper, and paperboard industry with over-all North American defense planning.

The staff set-up and activities of the NRSB are presently undergoing a reorganization, at the direction of its acting chairman, Dr. John R. Steelman. It seems likely that when this reorganization is completed, industrial consultants and task groups will be used less intensively by the NRSB than heretofore; but the work that remains to be done will, in my judgment, require a continuation of competent representation from our industry on the staff of the NRSB.

(*) Presented here is an excerpt from Mr. Porter's report to E. W. Tinker, executive secretary of the American Paper and Pulp Association, following the termination of his work with the National Relations Security Board on June 30, 1949. (Refer to item in this issue under "Associations.")

PAPER SKETCHES

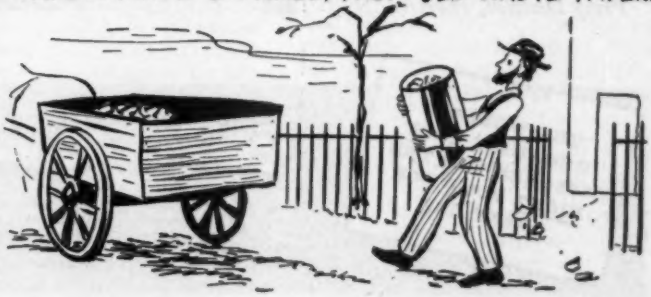
TO INCREASE THE WEIGHT OF THE BALES OF RAGS THEY SOLD TO PAPERMAKERS, CROOKED DEALERS OF THE MID-1800's SOMETIMES ACTUALLY PUT SAND IN THE BALES!



LABORATORY FILTERS WERE BEING MADE OF PAPER AS EARLY AS 1756. BEFORE THAT, CLOTH WAS GENERALLY USED.

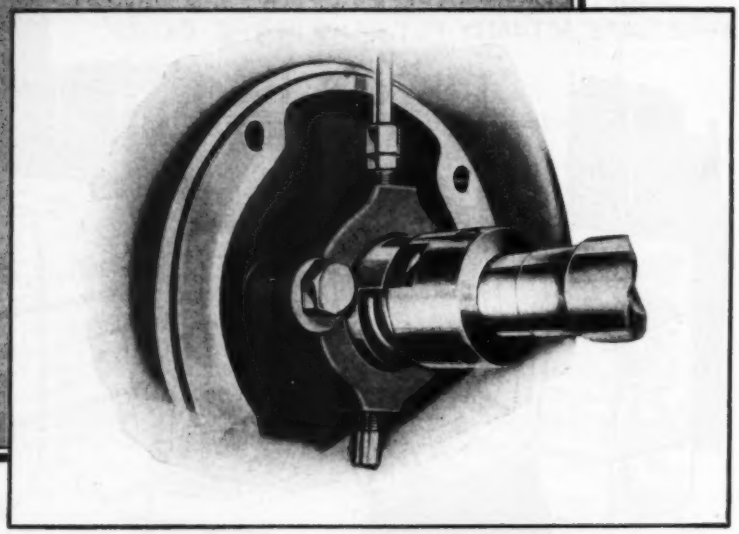
A NEW TYPE OF "NAIL KEG" IS BEING MADE OF FIBREBOARD. THIS CONTAINER IS EIGHT-SIDED, CORRUGATED, WITH TOP AND BOTTOM COVERS BOUND TOGETHER WITH STEEL STRAPPING. IT HOLDS THE SAME AMOUNT OF NAILS AS THE OLD-FASHIONED KEGS — BUT IS FAR LIGHTER IN WEIGHT.

AS EARLY AS 1800, A PAPERMAKER OF BERMONDSEY, ENGLAND, WAS TURNING OUT 700 REAMS WEEKLY OF PAPER MADE ENTIRELY FROM OLD WASTE PAPER.



When Packing Against CORROSIVE LIQUIDS . . .

you can depend on Worthington Worthite Pumps equipped with Type EA Mechanical Seals



Worthington Type EA Mechanical Seal for Worthite Type CG Chemical Pumps. Three sizes of seals for 23 sizes of pumps.

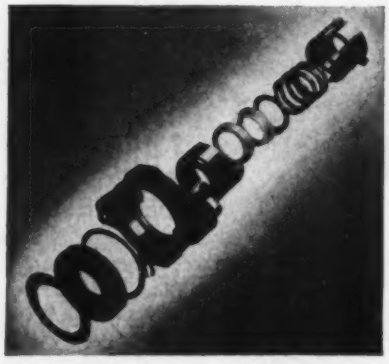
If you have been running into trouble with your stuffing boxes and packings, it's time to consider Worthington Type EA Mechanical Seals. They're especially designed for Type CG Worthite Pumps up to 1200 gpm capacity.

These seals have given outstanding performance in corrosive liquid service. The following distinctive features tell you why:

No stuffing box . . . no packing to replace. Outside assembly . . . easy to apply, simple to repair. No parts churning in acid. All parts made of corrosion resisting material. Pressure is adjustable without dismantling. Single coil Worthite spring. Tongue and groove drive.

Write for BULLETIN W-350-B-10.

For complete details about this Worthington contribution to better pumping of corrosive liquids and further proof that *there's more worth in Worthington* write for Bulletin W-350-B-10. *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*



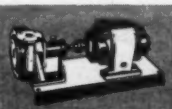
Exploded view of Worthington Type EA Mechanical Seal shows simplicity of this tested solution to tough stuffing box problems.

CGH-1A Worthite pump equipped with Worthington Mechanical Seal in a Southern chemical plant.

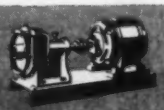
WORTHINGTON

CB-6

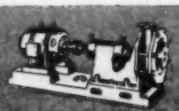
THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB



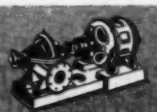
Types CB and CBL. Sizes ¾" to 10". Capacities to 5000 GPM; heads to 200 ft. Liquid ends of WORTHITE alloy.



Type CP. Sizes 1" to 4". Capacities to 1800 GPM; heads to 130 ft. Standard, all iron and all bronze.



Type CB. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller. WORTHITE



Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage, volute. For general service.

Current Comment . . .

The opinions expressed here are from a commentator close to the industry, who, in the past, has interpreted briefly the trends of the paper industry. His comments, which hereafter will appear at greater length than before, and in broader scope, are based entirely on economic and financial facts that emanate regularly from sources that speak with authority.

Paper Industry Appears Stabilized . . . Notwithstanding Contradictory Reports

▶▶▶ OUT OF A confusion of conflicting estimates combined with some unusual and radical price changes, the paper industry appears to be nearing, if not already arrived at, a stabilized situation. Unless there is a further and more serious slump in the heavy industries, such as steel, and in the other basic industries, the paper industry appears to have turned the corner; it is now in a period of watchful waiting ready to operate on a reduced quantitative basis, but with no further radical price cuts.

Violent contradictory reports have been issued of late. The American Paper and Pulp Association survey of current demand shows demand in excess over consumption. The National Purchasing Agents Association, however, at Chicago was told a diametrically opposite story and that further price cuts are to be expected.

That the purchasing agents are more likely to be in error can be judged from the immediate effect of a general price cut in kraft wrapping papers. In order to step up sales and thus keep the mills operating at a profitable ratio of capacity, the price of a standard grade of kraft was cut to 6¼ cents. Instead of bringing out additional sales, the consumers appeared to think that this was a forecast of further reductions, and buying dried up. It took hardly more than a few days for prominent producers to realize the situation, and the price was jumped back a half cent. Something of the same consumer reaction has been noted in other major grades.

Production is now down to little more than 80 per cent of capacity, the usual break-even point for the industry as a whole, and barring unforeseen developments the third quarter of the year will not see much change in market conditions. With July a period for massed vacations in the industry, July production figures probably will show a marked reduction which erroneously may be construed as a falling off in business. The third quarter probably will be one of light purchases and reduced consumption, but the fourth quarter may show a sharp upturn in demand and a resultant increase in operating ratio.

One thing can be taken as certain. Prices cannot be reduced much below present figures without loss to the mills, and there is a growing tendency among manufacturers to refuse to sell below cost. Labor rates and other production costs will remain high, so few economies in operation can be effected. In large measure the operation costs have been curtailed by the elimination of wasteful processes and practices.

CAPITAL ECHOES

The Administration's time table for what it considered essential legislation has been hopelessly wrecked. Labor legislation has been the subject of debate for weeks and the end is not yet. With weather conditions as they have been, the lawmakers will not stay in Washington and swelter through the entire summer. Best indications are that the Taft-Hartley labor law will not be modified in any of its real essentials and leftist labor elements are complaining that they have been "betrayed" by the Administration.

Because of the serious results of the Supreme Court's ruling against basing point practices in the merchandising field, it is more than likely that some remedial legislation will be passed. The proposed legislation would permit non-collusive use of freight absorption and delivered prices.

While representatives of a score of nations are conferring in France on proposed further duty rate reductions by reciprocal trade agreements, the law allowing such agreements is facing hard sledding. The law which expired on June 30, contained the well-known peril point provision whose repeal the Administration demanded, offering instead a substitute giving the Administration untrammeled power to make reductions as it sees fit, but not to less than 50 per cent of the rates in effect January 1, 1945. At the time this is written, the substitute bill has been bogged down by the debate over labor legislation. Meanwhile, other bills have been introduced by the opposition which even go so far as to give the United States Tariff Commission power to change any rates at will, but not to a point which would endanger domestic industry. Even labor is showing a realization of the danger of undue tariff rate reductions, but the situation at the moment is little less than chaotic. The interest to the paper industry is principally in the fact that the pending negotiations in France involve a possible fifty per cent reduction in a tonnage representing nearly half of the production of domestic paper and paperboard mills.

▶▶▶ THE GENERAL BUSINESS let-down has had a delaying effect on the various projects for the development of a pulp and paper industry in Alaska. Some progress is being made, but enthusiasm on the part of prospective investors is waning despite the efforts of the Government foresters to keep the patient alive by the stimulation of promised profits. Because financiers who believe in earning money from their investments are not interested in building new newsprint mills, one congressman has gone so far as to propose that the Government finance such enterprises, either by heavy financial grants or by actual Government building and operation of such plants. The chances of success for such a proposal are zero, but the fact that such a proposal could be made is an example of the loose financial thinking at Washington.

▼

INCREASED CONSUMPTION OF WASTEPAPER IS GOAL OF SIX-POINT PROGRAM

The waste material dealers of the New York area have submitted to Secretary of Commerce Sawyer a six-point program to increase the consumption of wastepaper.

The program involves: (1) encourage the use of more wastepaper; (2) allocate the wood pulp production to restrict its use when old papers can be used; (3) ask the ECA to sell our wastepaper abroad instead of allowing European purchases from other countries; (4) abolish the committee set up by the mills using wastepaper, as its existence is no longer necessary; (5) investigate the present situation to determine its cause, and (6) develop the facts as to the use of children to create a wastepaper surplus.

A series of conferences with representatives of dealers and users of waste-

paper and the labor unions affected is said to be planned by the Department of Commerce.

▼

FINANCIAL

▶▶▶ PAPER MILL securities suffered with the rest of the market when stock prices on Wall Street dropped during June to new lows for several years, but also shared in the later upturn, recovering more of the losses than the average recovery.

Celotex Corporation—Net income for six months ended April 30 was $272,000 as compared with $2,218,652 for the same period a year ago.

Masonite Corporation—Net income for nine months ended May 31 was $2,752,042 as compared with $5,117,959 for the same period a year ago.

Riegel Paper Corporation—Net income for sixteen weeks ended April 24 was $294,433 as compared with $368,367 for the same period in 1948.

Soundview Pulp Company—Net income for five months ended May 31 was $2,264,806 as compared with $2,427,790 for the comparable period a year ago.

United Board & Carton Corporation—Net loss for forty-eight weeks ended April 30 was $72,014 as compared with a profit for the comparable period a year ago of $1,199,072.

S. D. Warren Company—Net income for 1948 was $1,631,083 as compared with $2,190,794 for 1947.

Paper Mill Corporate Changes

Robert Gair Company—A subsidiary to be known as Fibre Container Corporation has been formed through the acquiring of the business of the Fibre Board Container Company, with shipping container plants at Richmond and Martinsville, Virginia. The acquisition of this company will provide an outlet for the Gair Company's southern kraft mill. All executives of the old company are continuing in some capacity with the new organization in which they retain a substantial investment.

Gardner-Richardson Company—A change of name has been announced, the new title, Gardner Board & Carton Company, being iintended to more truly identify the manufacturer with its product. No change in operation or capital is involved.

Scott Tissue Company—The offering of 45,000 shares of cumulative preferred stock, handled by a group of investment houses, and previously announced, was completely subscribed on the day set for the acceptance of requests for allocation of the securities.

Taggart Corporation—The previously announced plan to merge the Taggart Corporation with the St. Regis Paper Company was approved by an overwhelmingly large majority of the outstanding shares at the meeting on June 8. The company has for years been operated as a St. Regis subsidiary.

York Paper Manufacturing Company, Inc.—The Common Pleas Court at York, Pennsylvania, has ordered the sale of the company's mill and other property. The plant was purchased in 1947 by Joseph DiCandia for $300,000. A cash payment was made of $27,000 and the balance of the amount was covered by a 2½ per cent mortgage.

New York Stock Exchange—Stocks

	Closing Prices June 24	May 25
A.P.W. Products	*2⅜-2⅞	*2⅜-2⅞
Celotex	15¼	18¼
Same Preferred	15⅜	*16⅞-17¼
Certain-teed Products	10	10⅜
Champion P & F Co.	19	20¼
Same Preferred	91½	93
Chesapeake Corp.	*18⅛-18⅜	18½
Container Corp.	31	33
Same Preferred	90	*95½-96
Continental Diamond	6¼	7
Crown Zellerbach	22	22⅜
Same Preferred	90	97½
Same $4 Preferred	*89¼-91	*90-91
Dixie Vortex	*24¼-25¼	26
Same "A"	46½	50
Eastern Corp.	8½	9¼
Robert Gair	5	5⅜
Same Preferred	15	*15½-16
Gaylord Container	16⅜	17½
International Paper	44⅛	46¼
Same Preferred	93	95⅝
Kimberly-Clark	18	19
Same Preferred	91½	98¾
McAndrews & Forbes	32½	*31¼-32
Marathon	17⅜	19⅜
Masonite	41	44
Mead Corp.	14	14
Same Preferred	73	70½
Same 2nd Preferred	28⅜	*29¾-31⅞
National Container	5¼	5½
Paraffine Cos.	15⅜	17⅛
Same Preferred	102¼	*103-104¼
Rayonier	23⅜	23⅝
Same Preferred	28½	30
Scott Paper	53⅜	*52¾-54
Same Preferred	93	*94¾-96
St. Regis	6¾	8⅞
Same Preferred	80⅞	*84-84⅛
Sutherland Paper	32	33⅜
Union Bag & Paper	21¼	24¼
United Bd & Carton	4⅜	5⅛
United Wall Paper	4⅜	*3¼-3¾
Same Preferred	*23½-24¼	*22-23
U.S. Gypsum	90	90¼
Same Preferred	170	181¾
West Va P & P Co	37	39¼
Same Preferred	105	105½

New York Stock Exchange—Bonds

A.P.W. Products 3%	74⅞	84⅜
Celotex 3½%	101½	101
Champion P & F Co 3%	101⅛	101
Mead Corp 3%	102	100½

New York Curb Exchange—Stocks

Am Writing	5⅜	*5⅜-5½
Great Northern	32⅞	34⅝

*Closing Bid and Asked Prices

Good form is the forerunner of a perfect dive.
Good felts, the forerunners of a perfect sheet.
It's good form to order The DRAPER FELT.

The DRAPER Felt

DRAPER BROTHERS COMPANY

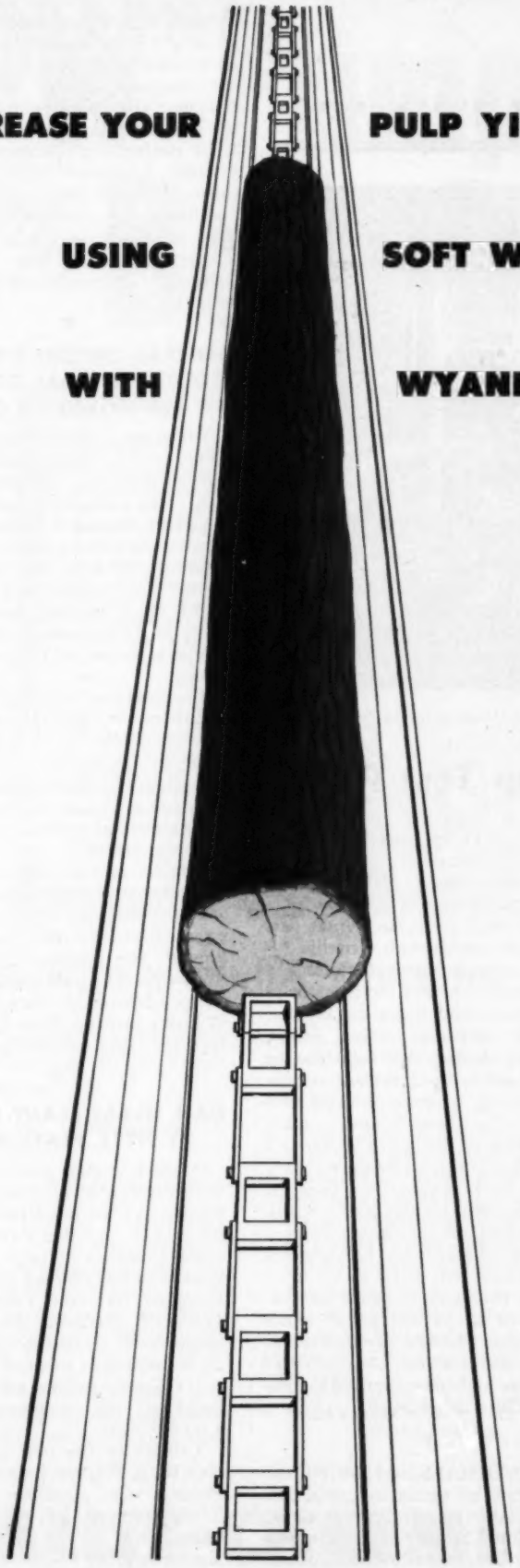
Woolen Manufacturers Since 1856

CANTON, MASSACHUSETTS

RALPH E. BRIGGS, *Sales Manager*

● BRADFORD WEST, *Pittsfield, Mass.* ● WILLIAM N. CONNOR, *Jr., Canton, Mass.* ● L. H. BREYFOGLE, *Kalamazoo, Mich.* ● ● WALTER A. SALMONSON, *2514 Northeast 59th Ave., Portland, Oregon* ● L. L. GRIFFITHS, *Jr., Kalamazoo, Mich.* ● ● HAROLD H. FISH, *Syracuse, N. Y.* ●

INCREASE YOUR PULP YIELD, USING SOFT WOODS, WITH WYANDOTTE SODA ASH



By using the semi-chemical pulping process—with Wyandotte Soda Ash—you can widen your selection of pulp woods and reduce your pulp losses in processing.

This process was developed by Forest Products Laboratory to make available soft woods for pulp production.
In the semi-chemical process, the wood is cooked in a sodium sulfite solution, then treated with up to 15% chlorine (for further delignification) and bleached with 1 to 1½% available chlorine.

One producer reports that the process results in a pulp yield of 56 to 58%—about 10 to 12% higher than the normal sulfite yield.

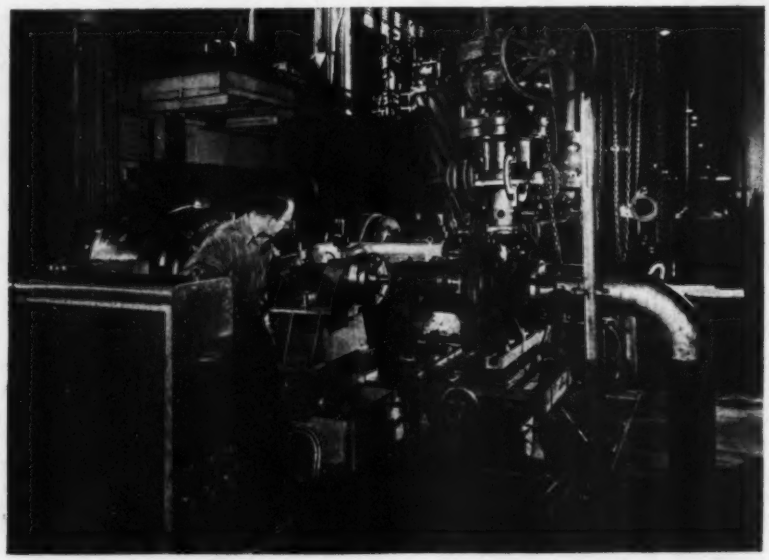
If you are considering the semi-chemical pulping process, why not get in touch with Wyandotte Chemicals Corporation?
As one of the world's oldest and largest producers of Soda Ash, Wyandotte is in a good position to furnish you with prompt, dependable deliveries of this basic chemical.

Wyandotte Chemicals Corporation
Wyandotte, Michigan • Offices in Principal Cities

SODA ASH • CAUSTIC SODA
BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE
CHLORINE • HYDROGEN • DRY ICE
SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE
PROPYLENE DICHLORIDE • CHLOROETHERS
AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

Wyandotte
REG. U. S. PAT. OFF.

Allied . . . . . .



Paper stock pump is lined up by means of control levers prior to testing

Allis-Chalmers New Pump Test Floor

▶▶▶ RECENT INSTALLATION of a new centrifugal pump test floor by Allis-Chalmers Manufacturing Company has greatly improved the company's long-standing policy of obtaining and maintaining on file complete performance data on every pump it builds. Designed to provide for both maximum testing accuracy and minimum testing time and expense, the new facilities are expected to prove of great value to both pump designers and users as well as reducing shipment time on pump orders.

The application of a new speed measuring device, believed to be the most accurate mechanism ever built for continuously measuring and recording speed, is used in conjunction with a Baldwin electric strain-type torque meter to obtain the horsepower input into a pump . . . a method considered simpler and more accurate than measuring the input with a calibrated motor. Accurate readings of quantity of water pumped are provided by the use of weigh tanks rather than wiers. This method also makes possible taking of test points automatically, by means of a photoelectric cell which "reads" the weigh tank scale. Motor speed, torque and pump discharge and inlet pressure are all recorded continuously during the test period, the recording meters and test timers being controlled by the photoelectric circuit.

Reduction in time and labor required to make pump tests is achieved by a simplified setup procedure. Three permanent test stands with movable individual hydraulic-powered motor and pump pedestals permit the operator to line up pump and motor quickly and simply by means of control levers, eliminating shimming and shifting the motor around by hand. Suction and discharge piping, designed for easy connection to the pump flanges, is made of aluminum so that it can be handled easily without need for hoists or cranes. Pressure meter connections plug in. Since the multi-horsepower, multi-speed motors on the stands cover a wide range of speeds and horsepowers, motors rarely will have to be interchanged, eliminating change of connections to meters and power source for each test. The new development of these various features is expected to reduce time and labor required for testing by at least 60 per cent.

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▶▶▶ MATERIALS HANDLING machines (fork-lift trucks, industrial towing tractors, and handling attachments) manufactured by the Clark Equipment Company are to be sold exclusively through independent franchised dealers, effective immediately, according to an announcement by the president of the company, George Spatta. The franchise also includes in most cases the sale of service and service parts for Clark machines in operation. In most instances, key men of the former branch organizations, factory-trained by Clark and thoroughly experienced in familiar sales territories, have been franchised as dealers, or have been selected as partners in the newly-established dealerships.

▼

GENERAL OFFICES OF THE SOUTHERN COAL COMPANY ARE MOVED TO CHICAGO

The general offices of Southern Coal Company, Inc., were removed on July 1 from Memphis, Tennessee, to Chicago. The company is now located at 333 North Michigan Avenue, where it occupies the entire seventh floor.

Concurrent with the establishment of new headquarters at Chicago, the branch office, formerly located at 307 North Michigan Avenue, Chicago, will occupy a portion of the general office space.

The Southern Coal Company, one of the country's largest distributors of coal, also of stoves, has been located at Memphis for the past 53 years. A large staff will be maintained at Memphis, all of whom are specialists at serving the coal and stove needs of the southern territory.

Officials of the company who will be located at Chicago include: P. B. C. Smith, president; S. L. Jewell, vice president and director of sales; W. G. Blewett, vice president; J. L. Tucker, treasurer; R. E. Hagerty, secretary; Vaughn Mansfield, chief engineer; C. C. Davis, manager Stove Division; and David S. Ogle, advertising manager.

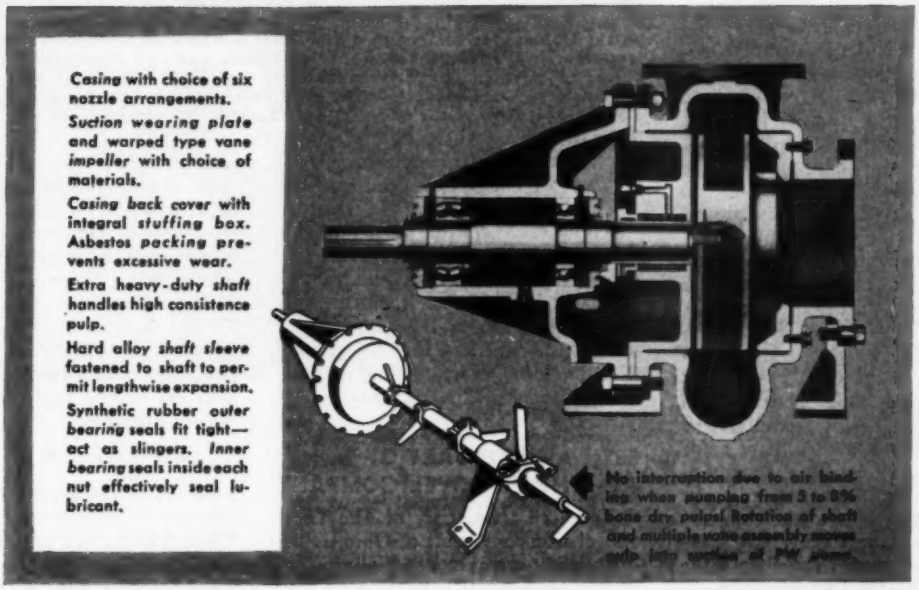
▼

CAN. GLASS PLANT BOUGHT BY PITTS. PLATE GLASS CO.

A window glass producing plant at St. Laurent, Quebec, Canada, has been purchased from Industrial Glass Company, Ltd., by the Pittsburgh Plate Glass Company through a newly-organized, wholly-owned subsidiary, the Canadian Industrial Glass Company, Ltd. Fifty thousand shares of Pittsburgh stock, equal to approximately $1,500,000 have been issued to Industrial Glass Company, Ltd., for the land, buildings, and equipment of the St. Laurent plant.

Officers of the new company are: Col. W. E. Phillips, president; Clare F. Wood, vice president; Harry W. Thorp, vice president; C. R. Fay, treasurer, and P. L. Tod, secretary and assistant treasurer.

"PW" Pump Delivers 8% Bone Dry Pulp!


Casing with choice of six nozzle arrangements.
Suction wearing plate and warped type vane impeller with choice of materials.
Casing back cover with integral stuffing box. Asbestos packing prevents excessive wear.
Extra heavy-duty shaft handles high consistence pulp.
Hard alloy shaft sleeve fastened to shaft to permit lengthwise expansion.
Synthetic rubber outer bearing seals fit tight—act as slingers. Inner bearing seals inside each nut effectively seal lubricant.
No interruption due to air binding when pumping from 3 to 8% bone dry pulp! Rotation of shaft and multiple vane assembly moves pulp into suction of PW pump.

• TEAMED WITH HI-DENSITY FEEDER FOR HEAVY-DUTY STOCK PUMPING

● Iron, Ni-Resist and Stainless Steel parts carried in stock for quick shipment.

● Heavy-duty construction — Oversize shaft.

● Variable discharge nozzle arrangements.

THE "PW"—"HI-DENSITY FEEDER" TEAM was developed specifically for heavy-duty requirements of stock pumping. Simple design — only four *easily removed* working parts in contact with stock pumped.

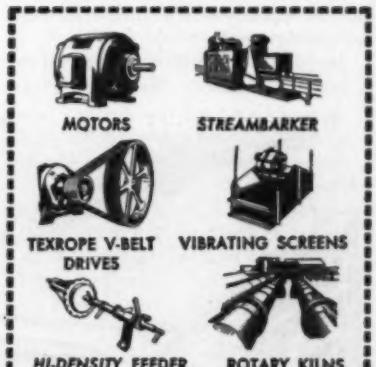
Features of PW Pump

▸ Entire rotating element removable without disturbing suction or discharge piping. ▸ Parts inventories can be cut as much as 70% because comparable size units of different ratings have interchangeable parts.

▸ Eight sizes with capacities from 175 to 8000 gpm — heads to 140 ft. ▸ Suitable for direct drive. Merely loosen four base bolts and the motor slides back along the base on steel plates. This insures proper alignment after pump is dismantled or reassembled.

For more details about the PW pump or Hi-Density Feeder, contact your nearby Allis-Chalmers Sales Office or write for Bulletins 08B7112 and 08B6725A. A-2739

ALLIS-CHALMERS, 991A SO. 70 ST. MILWAUKEE, WIS.



AND OTHER EQUIPMENT FOR PAPER MAKING . . .

Hi-Density, Texrope and *Streambarker* are Allis-Chalmers trademarks.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

DINNER CELEBRATION MARKS GOLDEN ANNIV. OF LEEDS & NORTHRUP

To celebrate the beginning of its 50th anniversary, Leeds & Northrup Company, Philadelphia, played host to 3500 employees and their guests at a dinner, entertainment, and dance in Convention Hall on June 4.

C. S. Redding, president of the company, greeted the assemblage on behalf of the company. His talk centered on the vision and achievements of Morris Evans Leeds, founder of the company and now chairman of the board.

Mr. Leeds was then presented with a gold 50-year service plaque and a bound testimonial expressing the organization's esteem for its founder. The testimonial was presented to Mr. Leeds jointly by Robert Craig, president of the company's Co-operative Association, J. H. Swope, president of the Leeds & Northrup Employees' Union, and Mr. Redding.

In 1899, Mr. Leeds founded the company to provide an American source of electrical measuring instruments then made only in Europe. In the fifty years since then, the company has become a source of supply for such equipment, and its instruments were used extensively in both world wars.

The advanced social and business concepts of Mr. Leeds, as well as the rigid standards maintained, have made the company a model for the study of scientific management and have brought many awards to the company and to Mr. Leeds personally.

The company received in 1947 the first annual Industrial Relations Award from the Philadelphia Chamber of Commerce, "because Leeds & Northrup has developed and maintained for the nearly 50 years of its existence one of this country's best industrial relations programs."

In 1920 Mr. Leeds was awarded the Edward Longstreth Medal by Philadelphia's Franklin Institute for invention of the "Leeds mechanism," the first automatic balance-type recorder generally accepted for industrial use. Since then he has received medals and awards from Forbes Magazine, the Institute of Management, the American Society of Mechanical Engineers, and in 1949 the American Institute of Electrical Engineers presented him with the Edison Medal, its highest award.

At the Golden Anniversary party of Leeds & Northrup in Philadelphia's Convention Hall, Morris E. Leeds, founder of the company and now chairman of the board, receives a testimonial of esteem from his associates. Left to right: J. H. Swope, president L&N Employees' Union, Mr. Leeds; Robert Craig, president of the L&N Co-operative Association; and C. S. Redding, president of the company.

▼

50TH ANNIVERSARY OF THEW SHOVEL COMPANY

The 50th anniversary of The Thew Shovel Company, Lorain, Ohio, is being celebrated this month. The history of this company really began more than 50 years ago, when, in 1895, Captain Richard P. Thew designed and built the first full revolving shovel (see illustration).

Richard Thew was captain of an ore-carrying lake boat, and he conceived the idea that a full revolving shovel would solve many of the ore-handling problems. At that time such work was done with "railroad type" shovels which traveled on railroad tracks; they worked over one end only and carried a boom that could be swung only from side to side. These shovels were slow and cumbersome, and tore up the wooden docks.

The Thew Automatic Shovel Company was incorporated in 1899; it was later re-incorporated as The Thew Shovel Company.

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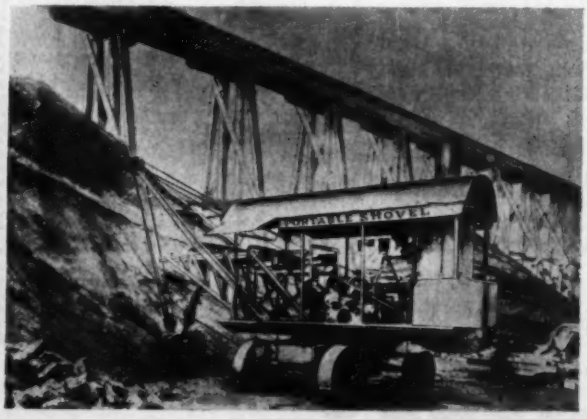
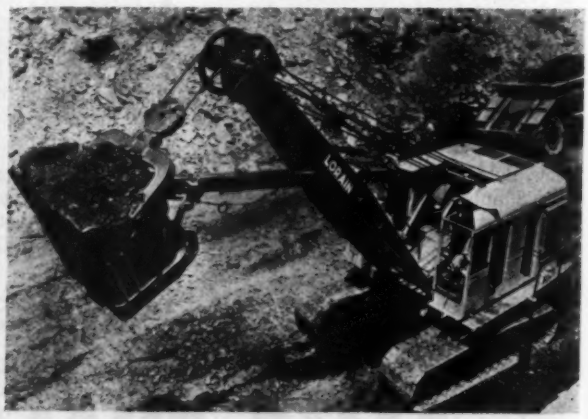
▶▶▶ A SALES OFFICE has been opened in Kansas City, Missouri, by Clinton Industries, Inc., corn processor and food manufacturer. Located at 1327 St. Louis Avenue, Kansas City 7, the office is under the direction of Lloyd H. Smith, vice president and general manager of the Bliss Syrup & Preserving Company for 21 years and an active food broker for many years. Clinton's complete line of bulk and packaged products will be handled by the new office.



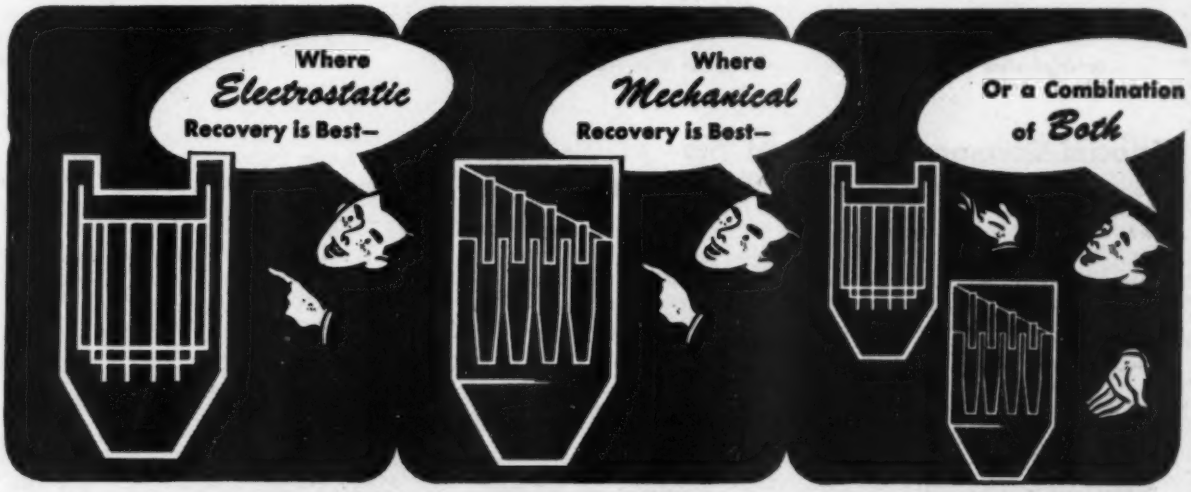


LEFT—The first Thew shovel, built in 1895, built four years before the company was incorporated. . . . RIGHT—A modern 1949 Lorain shovel

This is the UNIQUE ADVANTAGE

Western Precipitation provides for simplifying YOUR Dust Recovery Problems . . .

If you are not sure whether yours is a job for Cottrell or mechanical separation methods, you'll get an unbiased recommendation from Western Precipitation Corporation because this organization designs, engineers and installs BOTH!



THE *COTTRELL* ELECTRICAL PRECIPITATOR

Western Precipitation is the organization that pioneered the first commercial application of the now-famous Cottrell Electrical Precipitator. And its unique advancements and refinements in the basic methods, developed through more than 38 years of first-hand experience in Cottrell installations, assure you of the most modern in electrostatic recovery equipment from Western Precipitation Corporation. Cottrells handle dust, fume, fly ash, mists and other suspensions with high efficiency.

THE *MULTICLONE* MECHANICAL COLLECTOR

Companion to the Cottrell is Western Precipitation's widely used *Multiclone* equipment which offers far-reaching advantages in the mechanical separation of solids from gases. Its unique vane design makes possible multiple *small-diameter* separating tubes that combine high recovery efficiency with maximum compactness, minimum maintenance and wide-range adaptability to varying installation requirements. For mechanical recovery of solids, *Multiclone* is unsurpassed in operating efficiency, economy and installation simplicity.

COTTRELL AND MULTICLONE

And here's a priceless advantage provided by Western Precipitation Corporation . . . Frequently there are recovery problems where maximum efficiency and economy in first cost are obtained by using *Cottrell* and *Multiclone* equipment working together. There are many such recovery jobs—fly ash is one, perhaps yours is another—and you can get such a combination installation from one organization, under one responsibility, with one overall guarantee by bringing your recovery problem to Western Precipitation Corporation.

Send for these MULTICLONE and COTTRELL booklets!

REGARDLESS OF YOUR RECOVERY PROBLEM OR YOUR LOCATION

you can benefit by Western Precipitation's leadership and long experience in the science of recovering suspensions of all kinds—both liquid and dry—from gases, hot and cold. Western Precipitation Corporation installed the first successful Cottrell which is still in operation after 35 years of service. No matter what your industry, Western Precipitation is prepared to serve you in *all* parts of the world. Write, wire or call our nearest office.

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NOW SELLING...

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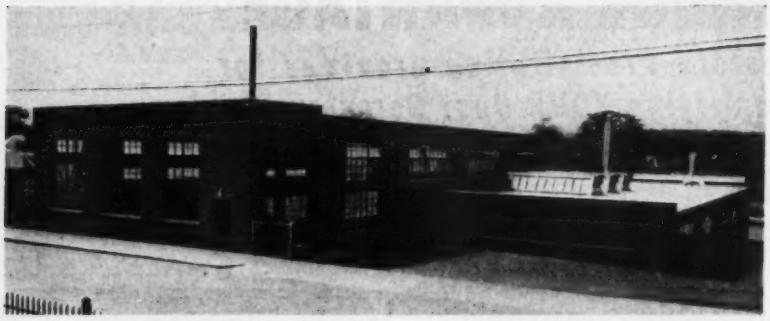
MULTICLONE Collectors
TURBULAIRE Spray Dryers

...in all parts of the U.S.A. and foreign countries.



Exterior view of new Ward plant addition at Stowe-Woodward, Inc.

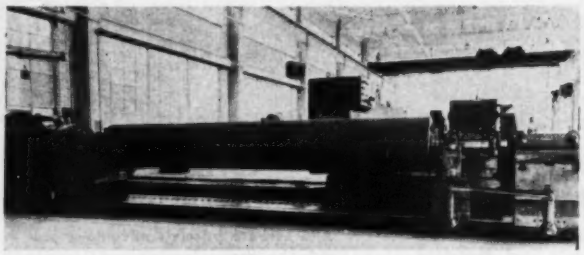
Special Ceremonies Attend the Dedication of Stowe-Woodward plant

▶▶▶ The official dedication of the new "Ward" plant of Stowe-Woodward Company, Newton Upper Falls, Massachusetts, took place June 9 and was attended by directors and officers of the company, the mayor of Newton and other guests and employees.

The new plant, which adjoins the other company buildings, is a completely equipped and self-sufficient factory for the manufacture of rubber-covered rolls. The working area of the building is one unbroken expanse except for a room partitioned off for compounding, milling, and calendering.

Although the plant is completely modern in every particular, perhaps of greater interest to the visitors at the dedication was the new, specially-designed single-wheel, rubber-roll grinder built by Farrel-Birmingham Company, Inc., of Ansonia, Connecticut. The manufacturer claims this is the first and so far the only grinder built by that company which possesses all of its features and improvements. The machine is designed to grind and crown rubber rolls 14 inches to 60 inches diameter and up to 351 inches between centers; it will handle rolls up to 30 tons in weight.

The dedication time was marked by the hoisting of a 36 in x 212 in press roll, destined for the West Virginia Pulp & Paper Company.



LEFT—New Farrel rubber-roll grinder (42 ft, 3 in) said to be the longest and largest of its type in the U. S. . . . RIGHT—Looking toward elevated loading platform, Ward plant, Farrel grinder in rear, lathes in foreground, vulcanizers at left

WATER TREATING EQUIPMENT MOVED BY WORTHINGTON TO DUNELLEN (N.J.) WORKS

The expansion of its Water Treating Equipment Sales Division has resulted in the transfer of that division by Worthington Pump and Machinery Corporation to the corporation's Dunellen Works at Dunellen, New Jersey. The move was effective June 20.

The transfer from the main plant at Harrison, New Jersey, where this equipment has been produced for the past ten years was due to increased activity in this field, and the fact that Dunellen Works production facilities are particularly well suited to this type of manufacture.

▼

MOORE & WHITE HAS BOUGHT SYCO MANUFACTURING CORP.

Announcement of the purchase of The Syco Manufacturing Corporation, Syracuse, New York, has just been released by George Lear, president of the Moore & White Company, of Philadelphia, manufacturers of papermaking machinery. The Syco company manufactures paper machine drives. All assets of Syco, among them the trade name and patents, are included in the sale.

Along with news of the transaction, it was stated that Harry E. Smith, chief sales engineer for Syco, has joined the Moore & White staff as a sales engineer.

The Syco drive unit will be manufactured hereafter in the Moore & White plant in Philadelphia, and will be sold exclusively by representatives of the company. All replacement parts and servicing for units now in use will be furnished by Moore & White.

▼

▶▶▶ A CONTRACT calling for the construction of Europe's largest oil refinery at Fawley, England, has been awarded the Foster Wheeler Corporation, New York, New York. The company will provide mechanical design and engineering, and will construct nine processing units. Preliminary work on the new project for Anglo-American Oil Company, Ltd., British affiliate of Standard Oil Company (New Jersey), already is under way.

NW SALES DIST. OFFICE OPENED BY COMBUSTION-ENGINEERING-SUPERHEATER

A new district office for the northwest territory, including the states of Washington and Oregon, has been opened by Combustion Engineering-Superheater, Inc., in the Skinner Building, Seattle, Washington.

H. D. Nickle has been appointed manager. He is a mechanical engineering graduate who joined the Canadian branch of the company in 1937 as manager of service and erection in Montreal. Later he was engaged in contract work and in sales relating to the pulp and paper industry. In 1945, he was transferred to the New York office in charge of Paper Mill Division sales.

▼

HARRIS-SEYBOLD HOLDS "HOUSEWARMING PARTY"

More than a thousand representatives of the graphic arts industry attended a "housewarming party" at the recently completed Eastern District headquarters of the Harris-Seybold

132" x 80' wire,
Sulphite Specialties

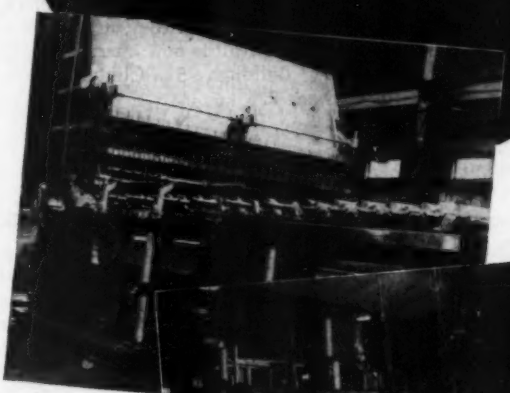
132" x 80' wire,
Sulphite Specialties

Sandy Hill Fourdriniers

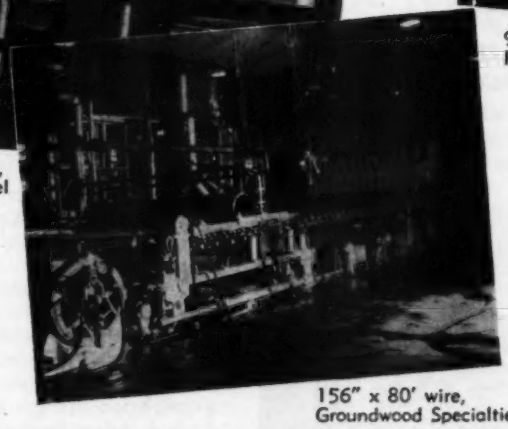
Some New Installations

92" x 35' wire,
Toilet Tissue

92" x 50' wire,
Facial Grades



156" x 65' wire,
Tissue and Towel



156" x 80' wire,
Groundwood Specialties

Sandy Hill is prepared to build any type of paper machine fourdrinier, either for improvement of formation and production, or in combination with a complete machine.

Sandy Hill Iron & Brass Works

Hudson Falls, N. Y.

Manufacturers of

Adjustable Cylinder Vats
Cylinder Paper Machines
Pulp Grinders
Dandy Roll Drives

Machinists and Founders Specializing in Paper and Pulp Mill Machinery.

Pulpers or Kneaders, Voith
Thickeners
Quick Opening Gate Valves
Bertrams Flow Distributors
Bertrams Shakes

Nelson Slice
Feltless Wet Machines
"Selective" and Corner Drives
Fourdrinier Paper Machines
"Packer" Screens

Castings
Bleaching Equipment
Scofield Felt Conditioners
Cleveland Type Bearings
Shaker Screens

Company, New York, New York, on June 1, 2, and 3.

The open house attracted guests from Maine to Virginia, and from every branch of New York's graphic arts empire. Visitors were welcomed by top-flight company officials who were present to display the new facilities. The company's New York offices and display rooms now contain more than 20,000 sq ft of floor space, occupying the entire first floor and basement at 380 Second Avenue, on the corner of East 22nd Street.

Among the visitors who enjoyed Harris-Seybold's hospitality during the three-day open house were lithographers and printers, book manufacturers and book binders, paper wholesalers and paper mill representatives, machinery and supply manufacturers, supply dealers, and representatives from trade organizations and trade schools.

Hosts were J. C. Dabney, Eastern District manager of the company, and his entire staff from New York, Boston, and Philadelphia.

▼

SANDY HILL NOW HAS AMERICAN RIGHTS TO MAKE NILSATON PRESSES

Demonstrations of a new type of continuous printing are now being conducted at the plant of the Sandy Hill Iron & Brass Works, Hudson Falls, New York. A general invitation is being issued to all printers of decorative wrappings, including printers of cellophanes, tissues, and label papers, as well as board and can stock printers and others.

The American rights to manufacture and sell the Nilsaton two-, three-, and four-color printing presses have been obtained by the Hudson Falls firm from Akerlund and Rausing of Lund, Sweden. Akerlund and Rausing is recognized as one of the largest and finest converting firms on the European continent.

In addition to the manufacturing and sales rights for the Nilsaton printing presses, the Sandy Hill Iron & Brass Works also has purchased the American rights for the Nilsa SOS Automatic Bag Machines, and demonstrations have already been conducted for the bag trade on these machines.

▼

▶▶▶ THE LOS ANGELES branch office of Tube Turns, Inc. (Louisville, Kentucky), has been moved to the General Petroleum Building, 612 South Flower Street. The new phone number is Madison 6-3219. It was formerly located on West Washington Boulevard. Manager of the Los Angeles branch is Norton P. Bosemer, who has been with the company since 1937 and in California since 1944.

▼

NEW QUARTERS FOR FOUR LINK-BELT BRANCH OFFICES

Four of Link-Belt Company's branch offices, established for customer service, have been moved to larger quarters:

The Cleveland office, headed by Paul V. Wheeler, district manager, is now located at 314 Hanna Building, Cleveland 15.

The Baltimore office, of which Charles C. Wiley is district manager, has moved to 2315 St. Paul Street, Baltimore 18.

The office in Huntington, West Virginia, headed by David W. Stevens, has been relocated at 1009 Fifth Avenue, Huntington 1.

The Newark, New Jersey, office, headed by John D. Riley, district manager, is now in its new quarters at 212 Essex Building, 31 Clinton Street, Newark 2.

▼

MEREDITH, SIMMONS & CO. CHANGES ITS NAME TO NATIONAL ADHESIVES LTD.

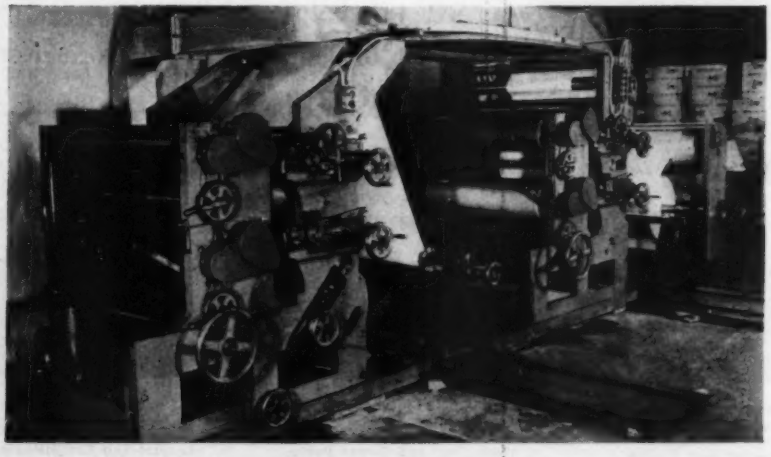
In the future, Meredith, Simmons & Co., Ltd., with plants in Toronto and Montreal and additional sales offices in Winnipeg and Vancouver, will be known as National Adhesives (Canada) Ltd. Having been affiliated with National Starch Products, Inc., and its predecessor company since the original incorporation in 1920, it is felt that this change will make the association as close in name as it is in actual operation.

The company produces in Canada a line of liquid adhesives, pastes, etc., as well as specialty products for use by the paper and pulp industry. The international operations of National's organization through its plants in the United States, England, and Holland give the Canadian affiliate the benefit of its research and manufacturing techniques, and this is now indicated by the new name.

▼

▶▶▶ AT THE SUMMER meeting of the Hydraulic Institute at Absecon, New Jersey, awards were made for papers entered in the Institute's Sixth Annual Engineering Essay Contest.

***CAPACITY CROWD** relaxes during housewarming party at Harris-Seybold's new Eastern District headquarters in New York. Representatives came in from Maine to Virginia for the open house*



Nilsaton Printing Press

Roy Carter of Worthington Pump and Machinery Corporation, Harrison, New Jersey, received first prize in the Practical Papers group for his treatise on Starting Torque Characteristics of Centrifugal Pumps, and A. M. Shaw, also of Worthington, received an award for his paper in the Technical group on Phenomena of Viscous Flow which was judged second of those in that group.

▼

PUSEYJONES MACHINE IS ORDERED FOR INDIA'S FIRST NEWSPRINT MILL

A contract for a 226-inch fourdrinier machine for the first newsprint mill in India has been awarded The Pusey and Jones Corporation, Wilmington, Delaware. The three-roll machine will be installed in the newsprint plant now under construction for National Newsprint and Paper Mills, Ltd., (Nepamills), Chandni, Central Provinces (Cf. P.I. and P.W., p. 99, April, 1949; and p. 1082, November, 1947).

It will be the first newsprint mill in the world to be based on a mixture of bamboo pulp and pulp from a deciduous tree called salai, both available in large quantities in the Central Provinces. Production is expected to begin early in 1950, and initial capacity 100 tons a day.

The engineering and purchasing are being handled by Ebasco Services, Inc., New York City.

▼

STANDARD OIL (INDIANA) CELEBRATES 60TH ANNIV.

During the week of June 16, the Standard Oil Company (Indiana), Chicago, celebrated its 60th anniversary. The company states that at the end of its 60th year, its production reached an all-time high. As it enters a new decade, the company will continue to emphasize research and development.

In 1889, Standard Oil (Ind.) was founded on the sandy marshland at Whiting (Indiana) with a capital of $500,000. The company is now rated as a $1,500,000,000 corporation. More than 200 chemists and engineers are at work in the Whiting laboratory, one of the country's outstanding petroleum research centers.

In the early days of the company, the principal product was kerosene. In 1913, Standard introduced the thermal cracking process which enabled refiners to crack petroleum molecules by means of high temperatures under pressure. Today, the company operates five refineries, and its distribution outlets are spread over 15 states. Through its subsidiaries, it markets products in 25 additional states.

Only the new

HILLS-McCANNA

metering and proportioning pump

offers such complete dependability and freedom from maintenance

THE NEW Hills-McCanna "K" Type Pump offers a whole new conception of metering and proportioning. A simple straight-line enclosed hydraulic drive submerged in an oil bath replaces the complex mechanical linkages found in most pumps. Built-in overload relief makes it impossible to damage motor or mechanism by inadvertant overloading. Horizontal cylinders with twin checks reduce danger of air binding and can be easily disassembled for cleaning without dismantling piping. Stroke may be adjusted quickly and easily, from zero to full capacity, *even while the pump is operating.* Just compare and you'll see why "K" pumps are more dependable and require practically no maintenance.

Hills-McCanna "K" Type Pumps have capacities to 300 gph per feed and pressure ratings up to 25,000 psi. Write for full details. HILLS-McCANNA CO., 2433 W. Nelson Street, Chicago 18, Illinois.

HILLS-McCANNA

metering and proportioning

pumps

Saunders Patent Diaphragm Valves

Force Feed Lubricants • Magnesium Alloy Castings

Associations

OLIVER PORTER RESIGNS— SUCCEEDED BY JAS. RITCHIE

The resignation of Oliver M. Porter, executive director of the United States Pulp Producers Association, became effective July 1. James L. Ritchie, who has been assistant secretary of the Association since 1945, has succeeded him. For about seven months past, Mr. Porter has been on leave from the Association, serving as head of the Pulp and Paper Section of the National Security Resources Board in Washington, D. C.

Mr. Porter has been with the paper industry since 1920 when he became associated with the American Paper and Pulp Association as assistant to Dr. Hugh P. Baker. After he left the Forestry troops of the Army where he served during World War I, Mr. Porter became a member of the faculty of the New York State College of Forestry, Syracuse, New York. His connection with the paper industry was effected when Dr. Baker, then dean of the College, became executive secretary of the APPA. Mr. Porter succeeded Dr. Baker in this position from 1928 to 1929; he then went to the Kraft Association. In 1933, Mr. Porter formed a connection with the Pulp Producers Association but he has been on leave at various times during and since World War II with the WPB and other governmental agencies as a loan to the Government by the paper industry. He will continue with the Pulp Producers Association in a consultative capacity.

Oliver M. Porter

James L. Ritchie was formerly assistant executive secretary of the American Paper and Pulp Association, and, like Mr. Porter, was loaned to the Government for war work during World War II.

▼

WAXED PAPER INSTITUTE HOLDS SUMMER MEETING

Long range plans for an accelerated research and promotional program in behalf of waxed paper were discussed at the summer meeting of Waxed Paper Institute, Inc. The two-day session was held in Hamilton, Ontario, June 16 and 17 at the invitation of George F. Clark, president of Appleford Paper Products, Limited, a member of Waxed Paper Institute.

The Honorable Dana Porter, Attorney General for the Province of Ontario, addressed the group when it met at the Royal Connaught Hotel in Hamilton. Presiding officer was the chairman of the Institute, William P. Patterson, Specialty Papers Company, Dayton, Ohio.

Following executive committee and general meetings, members toured Appleford's new plant. Special entertainment also was provided for members' wives who made the trip with their husbands.

▼

▶▶▶ THE 26TH ANNUAL convention of the National Association of Foremen will be held in Detroit, September 21-24. Some 2,500 delegates from more than 1,000 American companies are expected to be on hand when registration opens at the Statler Hotel and the Masonic Temple. The theme of this year's convention will be "Greater production through united management." There will be ten separate sectional conferences and five separate workshops, each repeated four times. Registration privileges are extended to those who are not members to the extent that facilities permit.

▼

▶▶▶ NEW PRESIDENT of the Chemical Market Research Association is George W. Russell, who was elected at the annual business meeting held in New York City, June 9. Mr. Russell is assistant sales manager of American Cyanamid Company's Industrial Chemicals Division, and during the past two years has served the Association as chairman of the Publications Committee and the Program Committee. Organized in 1940, the membership of this association consists of market research specialists from about 90 leading chemical companies in the United States and Canada.

▼

INSTR. SOC. OF AMERICA PLANS 1949 CONFERENCE

A diversified technical program consisting of seventy-five papers in twenty-six sessions has been arranged by the Instrument Society of America during its 1949 Conference and Exhibit at the St. Louis Auditorium, St. Louis, Missouri, on September 12-16.

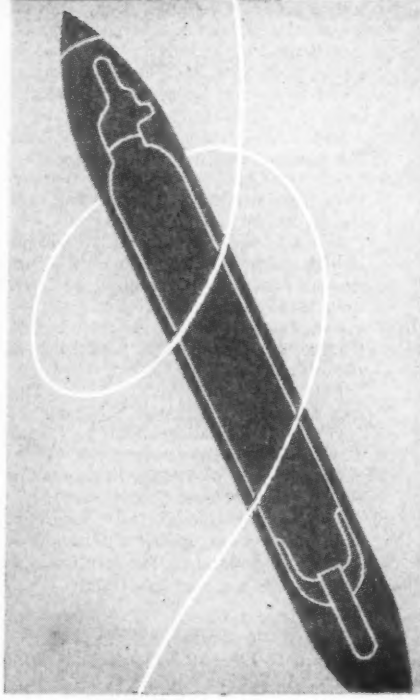
On the opening morning, Monday, September 12, the annual meeting of the ISA will be held. At this meeting, an innovation of ISA conventions, the president and four vice presidents will

ACTUAL SAMPLES of many of the hundreds of products protected by waxed paper were shown in this display of protective packaging materials exhibited at the AMA Packaging Exposition held at Atlantic City, May 10 to 13

TENAX FELTS

—excellently made—carefully tested
—with all the qualities to help you *make better paper*—at lower operating cost

IN THE LABORATORY OF THE LOCKPORT MILL



Numerous and thorough tests are applied at each stage of production of Tenax Felts, to insure attainment of the excellence which contributes to the high quality of your paper—the efficiency of your operation.

The Lockport representative in your territory is fully qualified to advise on all technical questions relating to felts. He is at your service as is our plant and all its people. We invite your inquiries.

LOCKPORT FELT COMPANY · NEWFANE, NEW YORK

Harry Weston Awarded Arents Medal by Syracuse University

▶▶▶ "FOR EXCELLENCE in advancement of industrial education," Harry E. Weston was awarded the George Arents Pioneer Medal by Syracuse University on June 4.

For twenty years, Mr. Weston was with *The Paper Industry*, as advertising manager (1927 - 1932), as editor (1932-1939). He served as editorial director of THE PAPER INDUSTRY AND PAPER WORLD, 1939-1947.

Trained in pulp and paper manufacture at the New York State College of Forestry, Syracuse, where he was graduated in 1921, Mr. Weston previously had worked for the Hinckley Fiber Company, in his native village, Hinckley, New York. He began his work in industrial education as an instructor in forest chemistry at the New York State College of Forestry from 1920-1923; he was assistant professor of pulp and paper manufacture from 1923-1926. These were the formative years of the first major course in pulp and paper manufacture to be offered by any forestry college. Mr. Weston left the College to become associated with a Chicago firm handling pulp and paper mill equipment. A year later he left that position to become a staff member of *The Paper Industry*. In 1948, Mr. Weston left THE PAPER INDUSTRY AND PAPER WORLD to take on executive responsibilities and more direct educational work in the industry through the American Pulp and Paper Mill Superintendents Association.

The award was given to Mr. Weston for his constant advocacy of "greater use of college trained men, special training methods for pulp and paper mill workers, and improved safety practices."

give brief statements of the activities and objectives of the committees under their jurisdiction. The theme of this meeting will be, "What Your Society is Doing—Reports of Officers and Committees."

Attendance is hoped to equal the figure of over 12,000 who attended the last Conference and Exhibit.

▼

NAT'L TAPPI PRESIDENT BACHMANN SPEAKS BEFORE EMPIRE STATE SECTION

At the spring meeting of the Empire State Section of TAPPI, the Association's national president, Albert E. Bachmann, was one of the featured speakers. The meeting was held June 2-4 at Bolton Landing on Lake George, New York.

New chairman of the Section is C. E. Foster, Jr., of Oswego Falls Corporation, Sealright Division, Fulton, New York. He succeeds Dr. James E. Foote, of E. B. Eddy Company, Hull, P.Q. Dr. Foote, who recently assumed his present position, was presented with honorary membership.

R. N. Prince, of the American Cyanamid Company, Castleton-on-Hudson, New York, was re-elected secretary-treasurer.

▶▶▶ THE ELEVENTH annual forum of the Packaging Institute will be held at the Hotel Commodore, New York, on October 24, 25, 26. A biopackaging (packaging of living things) forum is planned. Also the Institute has invited all the fruit and vegetable prepackaging companies to come to this forum and put on their own separate show preparatory to forming some sort of an organization, either independently or affiliated with the Packaging Institute.

▼

▶▶▶ THE FALL MEETING of the Southern Division of The American Pulp and Paper Mill Superintendents Association will be held October 24, 25, and 26, at the Frances Hotel, Monroe, Louisiana. Philip J. Hannan (Southern Advance Bag & Paper Company, Inc., Hodge, Louisiana), chairman of the Southern Division, made the announcement.

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COMING EVENTS

July 26—Michigan Div., Superintendents Association, Annual Sports and Field Day, Kalamazoo Country Club, Kalamazoo, Mich.

Sept. 8-10—N. Y.-Canadian Div. Superintendents Association, Champlain Hotel, Bluff Point, Plattsburg, N.Y.

Sept. 12-15—TAPPI (National) General Fall Meeting, Multnomah Hotel, Portland, Ore.

Sept. 16—Conference of Northeastern Wood Utilization Council on Wallboards will be held in Cambridge, Mass., with the co-operation of Harvard University. Attendance limited to 75. Obtain invitations by writing E. L. Heermance, Sec., Northeastern Wood Utilization Council, New Haven 6, Conn.

Sept. 26-29—National Paper Trade Ass'n, Fall Meeting, Stevens Hotel, Chicago.

Sept. 30-Oct. 1—New Jersey-Delaware Div., Superintendents Association, fall meeting, St. Patrick's Inn, Mt. Pocono, Pa.

Oct. 4-7—Society of Industrial Packaging and Materials Handling Engineers, Fourth Annual Exposition, Convention Hall, Detroit, Mich.

Oct. 14-15—Southeastern Div. Superintendents Association, Hotel Roanoke, Roanoke, Virginia.

Oct. 24-26—Supt. Ass'n, Southern Div., Fall Meeting, Frances Hotel, Monroe, La.

Oct. 25-28—National Safety Council, 1949 National Safety Congress, Chicago.

Oct. 31-Nov. 3—TAPPI, Engineers Conference, Statler Hotel, Boston, Mass.

Nov. 1-5—Pacific Chemical Exposition, California Section, American Chemical Society, Civic Auditorium, San Francisco, California.

1950

Jan. 16-19—First Plant Maintenance Show, Auditorium, Cleveland, O.

PEERLESS VERTICAL TURBINE PUMPS

CUT OVERHEAD Underground

For your next job consider the flexibility and the efficiency of the Peerless vertical turbine pump.

As a deep well pump, for example, a Peerless pump can assure you of an independent source of clean water from your own well—water that will be of constant temperature, of constant chemical analysis. To cut overhead underground, Peerless turbine pumps embody many exclusive engineering advantages, such as patented Double Bearing-Double Seal bowl construction, all contributing to their extended trouble-free pumping life.

As another example, a Peerless vertical turbine pump utilized as a close-coupled pump, assures you of full turbine pump utility and capacity from short or medium settings. They're ideally suited for installation over pits, sumps or basins or for pumping water from surface sources. The 4 pumps shown above are indicative of this type of service. You can easily visualize their application to condenser cooling, cooling tower service, etc.

Regardless of your requirements, a versatile Peerless vertical turbine pump will squarely meet your pumping demands. Peerless offers widest capacity range, from 15 to 30,000 gpm against heads to 1000 feet. You can have your choice of oil lubricated or water lubricated types and a choice of power drive, direct-connected electric, right angle gear, V or flat belt or combination drives. Write for individual Bulletins describing the applications of Peerless pumps to these services.

NEW PEERLESS INDIANAPOLIS PLANT IS DEVOTED ENTIRELY TO PUMP PRODUCTION AND SERVICE

Here is one of America's newest pump plants—19 acres of modern manufacturing facilities devoted to precision production of horizontal and vertical pumps, centrally located at Indianapolis. Plan with Peerless for pumps plus fast, complete pump service.

Peerless
VERTICAL AND HORIZONTAL
Pumps

fmc
PEERLESS PUMP

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION

Los Angeles 31, California — Indianapolis, Indiana

District Offices: New York 5, 37 Wall Street; Chicago 40, 4534 N. Broadway; *Atlanta Office:* Rutland Building, Decatur, Georgia; Omaha, Nebraska, 4330 Leavenworth Street; Dallas 1, Texas; Fresno, California; Los Angeles 31, Calif.

Safety

CARTHAGE MILL, CONTAINER CORP., COMPLETES MILLION MAN-HOURS ACCIDENT FREE

A perfect safety record was marked by the Carthage (Ind.) mill of Container Corporation of America on June 28, when at 7:00 A.M. 861 days of operation—*one million man-hours*—was completed without a lost-time accident.

The Carthage mill includes two machines for the production of strawboard and one for the production of liner board. Personnel averages 180 people. Its enviable record is the close co-operation between management, union, and employees in carrying out a well-organized safety program.

In the course of receiving its million-hour record, the mill has won several trophies including:

1) Edward Benton Fritz Memorial Trophy, for best safety achievement among 219 mill members of the Paper and Pulp Section, National Safety Council, in the Paper Industry Annual Safety Contest, July 1, 1947, to June 30, 1948. (Cf. P. I. and P. W., Nov., 1948)

2) National Safety Council Award Winner, Group D, Paper and Pulp Mill Division, Paper Industry Safety Contest July 1, 1947 to June 30, 1948.

3) Container Corporation of America First Place Trophies, for the years 1947 and 1948.

▼

OHIO STATE UNIV. AWARDS FIRST ADVANCED SAFETY DEGREE TO GEO. HARPER

The first advanced degree in safety engineering to be granted in the history of education in the United States was conferred upon George W. Harper, director of safety, The Mead Corporation, at commencement ceremonies at Ohio State University. Mr. Harper was one of 2457 graduates who received degrees.

The degree of master of science in industrial engineering (specializing in safety engineering) given to Mr. Harper culminates a two-year program of study under the guidance of Dr. Paul N. Lehoczky, head of the department of industrial engineering.

Degrees previously held by Mr. Harper include: Metallurgical Engineer from the University of Minnesota; Bachelor of Education, from State Teachers College, Superior, Wisconsin. He has taken graduate work at Illinois Institute of Technology, University of Indiana, and Purdue University.

Mr. Harper has had eleven years of experience in industrial safety at American Steel and Wire Company, Duluth; Inland Steel Company, East Chicago, Indiana; Talon, Inc., and Western Cartridge Company. He has been in his present position with The Mead Corporation for the past three years. He is a member of the American Society of Safety Engineers, and vice chairman of the Pulp and Paper Section of the National Safety Council.

George W. Harper

▼

FRED BERRY NOW PRESIDENT ST. LOUIS CHAPTER AMER. SOC. OF SAFETY ENGINEERS

At the recent election of the St. Louis Chapter, American Society of Safety Engineers, J. Fred Berry, of the Alton Box Board Company, Alton, Illinois, was made president for the coming year.

Mr. Berry is a past chairman of the Paper and Pulp Section of the National Safety Council, and is well known for his active participation in the work of that organization.

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AWARDS FOR SAFETY RECORD

A plaque was presented to the Puget Sound Pulp & Timber Company of Bellingham, Washington, for the greatest improvement in its no-accident record over the past year at the Western Forest Products Safety Conference held in Seattle, June 1-3.

Other safety award winners included Long-Bell Lumber Company, Weed, California; Weyerhaeuser Timber Company, Snoqualmie, Washington; White River Lumber Company, Enumclaw, Washington; and the British Columbia Pulp and Paper Company, Port Alberni, British Columbia, Canada.

New officers of the organization include Byron Oyster (Weyerhaeuser Timber Company, Tacoma, Washington), president; B. K. Wickwire (Longview Fibre Company, Longview, Washington), vice chairman; C. R. Rustemeyer (Vancouver, British Columbia), secretary; and E. H. Crosby (Portland, Oregon), treasurer.

W. D. Welsh, of the executive offices of Crown Zellerbach in San Francisco, was the featured speaker at the annual banquet held on the opening night.

▼

SAFETY CONTEST SCORES

▶▶▶ THE ANNUAL CONTEST among mills in the Paper and Pulp Section of the National Safety Council will close June 30. The following perfect scores for eleven months of the contest show no change from the previous month. The injury frequency rate for all participants reporting for May was 9.11, well below the 10-month cumulative rate of 11.43.

Division I—Paper and Pulp Mills

Group A (None)

Group B (None)

Group C

Spaulding Fibre Co., Inc., North Rochester, N.H.

Certain-teed Products Corp., York, Pa.

Group D

Hollingsworth & Whitney Co., Madison, Me.

Container Corp. of America, Carthage, Ind.

Armstrong Cork Co., Pensacola, Fla.

Certain-teed Products, Richmond, Calif.

Mead Corp. (Wheelwright Div.), North Leominster, Mass.

Marathon Corp., Ashland, Wis.

Strathmore Paper Co. (Mill No. 1), Woronoco, Mass.

American Writing Paper Corp. (Albion Div.), Holyoke, Mass.

Fort Wayne Corrugated Paper Co., Vincennes, Ind.

National Gypsum Co., Newburgh, N.Y.

Division II—Paper and Board Remanufacturing

Group A (None)

Group B

Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Canada.

Group C

Kimberly-Clark Corp., Appleton, Wis.

Marinette Paper Co., S. Glens Falls, N.Y.

Gaylord Container Corp., Tampa, Fla.

Pillsbury Mills, Inc., Wellsburg, West Va.

Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.

Certain-teed Products, Buffalo, N.Y.

Flintkote Co., Hollywood, Calif.

ABC Corrugated Box Co., Minneapolis, Minn.

Bay West Paper Co., Green Bay, Wis.

ALWAYS NEW FRONTIERS for POWELL

When the Oklahoma Territory was opened at 12 noon on April 22, 1889, more than 20,000 people were lined up on the border. At a signal by U.S. Cavalry, a remarkable race for homesteads ensued.

The amazing development of the United States has been a result of continually opening new frontiers—not only geographical, but scientific and industrial as well. In the latter sphere, The Wm. Powell Company has a long and proud record of settling the flow control requirements of each new industrial frontier as it has appeared—including such achievements as inventing the first regrinding globe valve, pioneering in the field of corrosion resistance, meeting the need for specially designed valves for special services, and many others.

As a result of this continual pioneering, *only* Powell makes such a complete line* that no matter what your flow control requirements may be, Powell has the valves to meet them. Moreover, Powell Engineers are always ready to help you solve any problems that might arise.

*** Powell Valves are made in Bronze, Iron, Steel and a wide selection of Corrosion-Resistant metals and alloys. Valves of every type—Globe, Angle, Gate, Check, Non-return and Flush Bottom Tank Valves—are included in the Complete Powell Line.**

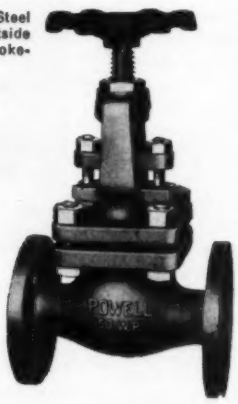

Fig. 1969—150-pound Stainless Steel Gate Valve with flanged ends, outside screw rising stem, bolted flanged yoke-bonnet and tapered solid wedge.

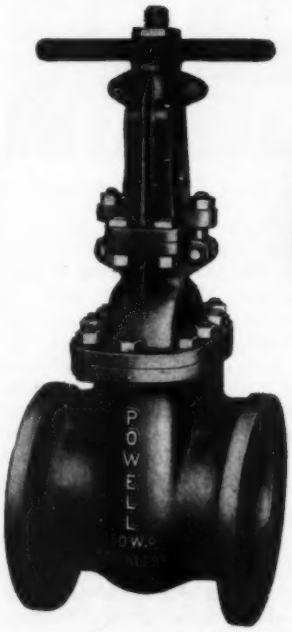

Fig. 2453-G—Large 150-pound Stainless Steel Gate Valve with bolted flanged yoke-bonnet, outside screw rising stem and tapered solid wedge. Made in sizes 5" to 30", inclusive.

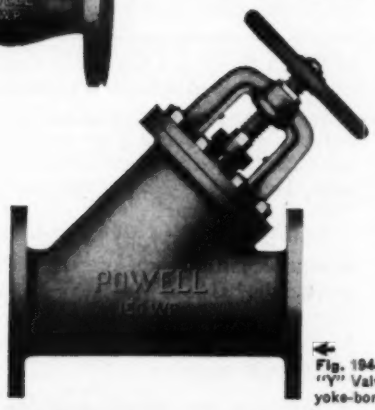

Fig. 1944—Large 150-pound Stainless Steel "Y" Valve with flanged ends, bolted flanged yoke-bonnet and outside screw stem.

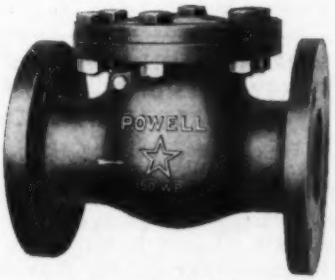

Fig. 2433—150-pound Stainless Steel Swing Check Valve with flanged ends and bolted flanged cap.

The Wm. Powell Company, Cincinnati 22, Ohio

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POWELL VALVES

Names in the News...

FORD MADE BOARD CHAIRMAN AT WYANDOTTE—SEMPLE OF MONSANTO TO SUCCEED HIM

E. M. Ford's election to chairman of the board of directors, Wyandotte Chemicals Corporation, effective September 1, 1949, was announced recently. Mr. Ford has held the presidency of the chemicals firm for six and a half years.

E. M. Ford

Robert B. Semple

Elected to succeed Mr. Ford as president and director of the corporation is Robert B. Semple, director of Monsanto Chemical Company's General Development Department. Mr. Semple has had many years of research and sales experience at Monsanto. He is a member of the American Chemical Society, American Institute of Chemical Engineers, and the Society of the Chemical Industry.

EDW. HUTCHINS RETIRES FROM I. P. CO. WITH A 35-YEAR SERVICE RECORD

Edward Hutchins, who retired as plant engineer of the Hudson River Mill of the International Paper Company, Palmer, New York, on June 1, was presented with a gift on June 20 by members of the mill's Technical Association at its meeting at Corinth, New York.

Mr. Hutchins, who is 71 years of age and a native of Dover, New Hampshire, completed 35 years of service with the International Paper Company upon his retirement. In 1912, he joined the company by accepting the position of assistant to A. H. White, the chief engineer. In this position, he supervised the design and construction of the new dam at the Hudson River Mill which was built to replace the one carried away by the 1913 flood. During these years, he also helped to design the company's plants at Gatineau, Three Rivers, and Dalhousie in Canada; also Feeder Dam, a power station located on the Hudson River a short distance above Glens Falls, New York.

In 1931, Mr. Hutchins was transferred to the Research Division of the International Paper Company in Glens Falls. He went to Palmer, New York, in 1937 and was in charge of the transfer of the core plant from the Fort Edward, New York, mill. Several years later he engineered the off-the-machine coater and then the machine coater installations. During the war he acted as plant engineer, and in 1945 he was named to that position. Since then and until his retirement he has been responsible for design and construction of improvements covered by an extensive expansion program.

▼

HOWARD AND LEWIS ARE PROMOTED BY HYSTER CO.

Two personnel changes recently were announced by the Hyster Company headquarters in Portland, Oregon, both effective June 1.

Theron Howard, head of tractor sales and service in the eastern division of the company since 1941, will become manager of the Peoria, Illinois, plant. Approximately 10 years ago, Mr. Howard came to Hyster from the Pennzoil Company, and has progressed through various departments of the business to his present position.

Theron Howard

J. F. Lewis

J. F. Lewis, formerly in charge of production and purchasing at the Peoria plant, has been transferred to Portland to assume the duties of chief production engineer. He will supervise parts and service, manufacturing engineering, tool design, and inspection in Hyster's three factories. Before joining Hyster, Mr. Lewis had a number of years as a tool designer with the Caterpillar Tractor Company, as well as with the Olds Motor Works and the Reo Motor Car Company.

▼

▶▶▶ *S. F. Thune* has been promoted to sales manager of the midwestern division of National Starch Products, Inc., with headquarters in Chicago. For the past three years he has served as sales manager of the Pacific Coast Division at San Francisco, and prior to that was with the midwestern division as supervisor, technical service.

Francis R. Loetterle will go to San Francisco as sales manager in Mr. Thune's place. A chemical engineer, he has served in the technical service department at both New York and Chicago.

WORTHINGTON PUMP HAS NEW PRESIDENT—OTHER OFFICIALS ARE PROMOTED

The election of Hobart C. Ramsey as president of the Worthington Pump and Machinery Corporation, Harrison, New Jersey, took place recently. He succeeds Clarence E. Searle who has been named vice chairman of the board of directors. Mr. Ramsey was formerly executive vice president. He joined the company in 1920 as a sales engineer in the Export Department, after serving in World War I as a Lieutenant Commander. He is an Annapolis graduate.

Succeeding Mr. Ramsey as executive vice president is Edwin J. Schwanhausser, formerly vice president in charge of sales. He started with Worthington in 1915 as an engineer.

John J. Summersby has been elected vice president in charge of sales. Mr. Summersby has been with the organization since 1916, and since 1937 has been assistant vice president and general sales manager.

Clarence E. Searle

Hobart C. Ramsey

E. D. Schwanhausser

John J. Summersby

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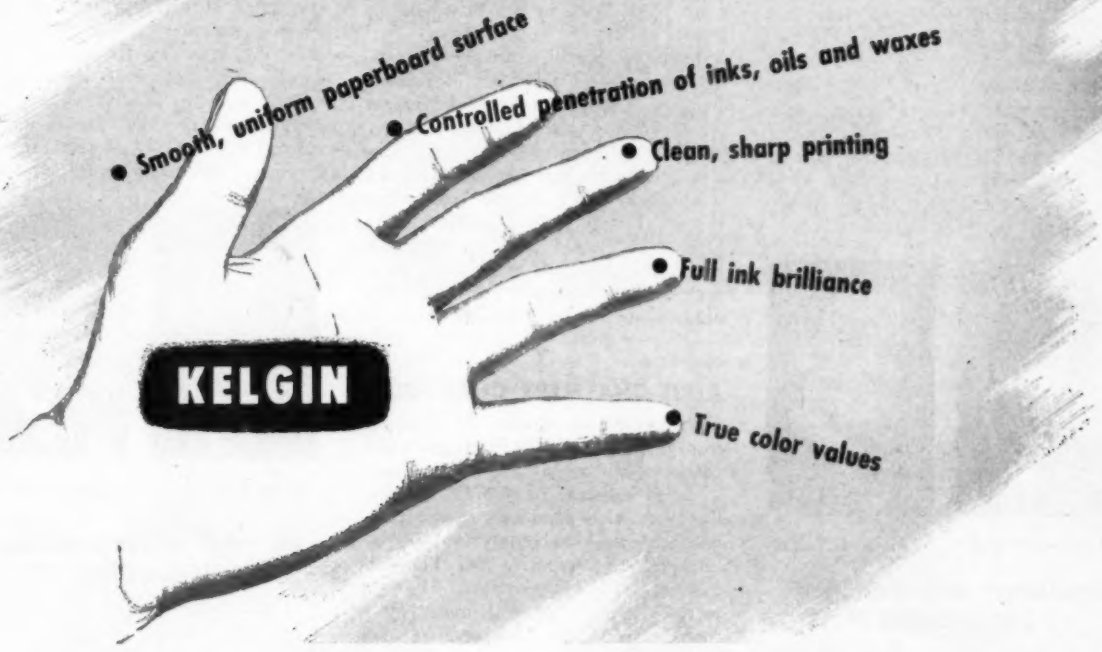

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J. E. HARTFORD NOW WITH BLACK-CLAWSON SALES STAFF

A new member of the Black-Clawson sales staff is J. E. Hartford, formerly production manager of paper mills for the Philip Carey Manufacturing Company, headquarters, Lockland, Ohio. This announcement was made during the last week of June by R. L. Kutter, sales manager of The Black-Clawson Company, Hamilton, Ohio.

Mr. Hartford enjoys a wide acquaintance in the paper industry. He is a graduate chemical engineer (Iowa State College), and all of his experience has been in this specialized field. Following graduation, he joined the U. S. Gypsum Company at its North Kansas City plant where he became paper mill superintendent. In 1941, he was moved to the company's South Gate plant as felt mill superintendent, and in 1944 became plant manager of the Jersey City plant.

J. E. Hartford

J. L. McDermott

McDERMOTT NEW HEAD OF THE RYERTEX DIVISION

J. L. McDermott has been appointed manager of the Ryertex Division of Joseph T. Ryerson & Son, Inc., Chicago, Illinois, steel distributors. He succeeds Kenneth T. MacGill who is retiring after 32 years of service with the company.

Mr. McDermott moves up from the post of western sales manager of the Ryertex Division which he has held since January 1, 1948. He has been with the company since 1923, serving as sales representative in Cleveland and Pittsburgh respectively prior to taking up headquarters at Chicago last year.

▼

PROF. LIBBY AWARDED C.E. DEGREE BY UNIV. OF MAINE

The professional degree of chemical engineer was awarded to Clarence E. Libby, head of the Department of Pulp and Paper Manufacture at New York State College of Forestry, by the University of Maine at its recent commencement.

Professor Libby is widely recognized for his work in chemical research, and he is especially well known throughout the papermaking industry. He graduated from University of Maine in 1916 with a Bachelor of Science degree.

Three patents are owned by Professor Libby—one on paper sizing, two on pulp purification. He also has two patents pending, one on pulp manufacture and a second on pulp bleaching.

▼

WESTINGHOUSE ELECTIONS

The election of three new officers of the Westinghouse Electric Corporation (Pittsburgh) was announced recently from New York by the board of directors.

James H. Jewell, manager of apparatus sales, and John M. McKibbin, assistant to vice president and manager of advertising and sales promotion, both of Pittsburgh, were elected vice presidents. Herbert P. MacDonald, treasury manager in the company's Eastern District office in New York City, was elected assistant treasurer. He also has been appointed credit manager of Westinghouse, and will make his headquarters in Pittsburgh.

▼

ALLIS-CHALMERS CHANGES

Promotion of Robert S. Fleshiem from manager of Allis Chalmers (Milwaukee, Wisconsin) electrical department to assistant to W. C. Johnson, executive vice president of the company's general machinery division became effective recently. Mr. Fleshiem succeeds J. D. Greensward, who was recently named general manager of the organization's Norwood (Ohio) Works.

The new manager of the electrical department is Roy M. Casper, formerly manager of the motor and generator section.

▼

▶▶▶ *B. J. Waters* has been elected president and general manager of the Mersey Paper Company, Ltd., Liverpool, Nova Scotia, Canada. He succeeds the late Col. C. H. L. Jones (Cf. P.I. and P.W., June, 1949). Shortly after Mr. Waters graduated from Ohio State University in 1914, he joined the staff of The Mead Corporation in Chillicothe, Ohio. In 1937 he became general manager and director of the Mersey Paper Company, and in 1947 was elected its vice president.

▼

▶▶▶ *Henry V. Bootes,* formerly assistant vice president, has been elected vice president in the sales department of the American Car and Foundry Company, New York City. Until joining ACF in 1947, Mr. Bootes was district manager of The Ohio Injector Company, Wadsworth, Ohio.

JOHN CARTER BECOMES NEW PRESIDENT OF OAKITE PRODS.

The new president of Oakite Products, Inc., New York, New York, is John A. Carter who has been associated with the organization for 34 years. Mr. Carter served in recent years as assistant to the president and, since December, 1947, as general manager of the company.

D. C. Ball, founder and president of Oakite, and long a pioneer in the development of specialized cleaning materials for industry, was elected to the office of chairman of the board. Former vice president, David S. Ball, was appointed by the board to the newly created office of first vice president, and H. Liggett Gray, James Beckett, and David A. Hearn were re-elected to the posts of vice president, treasurer, and secretary respectively.

John A. Carter

Ren R. Perry

REN PERRY MADE GENERAL SALES MGR. HARRIS-SEYBOLD

The newly-created position of general sales manager at the Harris-Seybold Company (Cleveland, Ohio) has been filled by the appointment of Ren R. Perry, formerly western district manager. H. A. Porter, vice president in charge of sales, said that this was another step in the re-organization of the sales department, which was started in 1944 with the integration of Harris Press and Seybold Cutting machine sales.

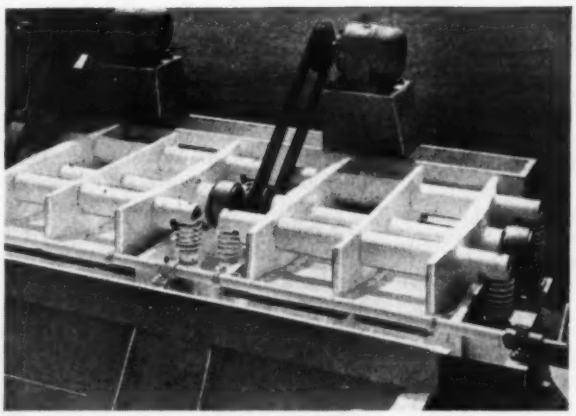
Mr. Perry has been with the company since 1926, serving in various sales positions in Cleveland, New York, New England, and the Western District. In his new capacity he will assume full responsibility for Harris-Seybold's field sales staff, and will be located at the company's general offices in Cleveland.

C. A. Loefgren, formerly Chicago metropolitan sales representative, has been appointed Chicago branch manager. J. G. Willis will continue as branch sales manager of the St. Louis and Twin City branches.

▼

▶▶▶ *W. E. Bittner* has been made vice president-purchases of the Diamond Alkali Company, Cleveland,

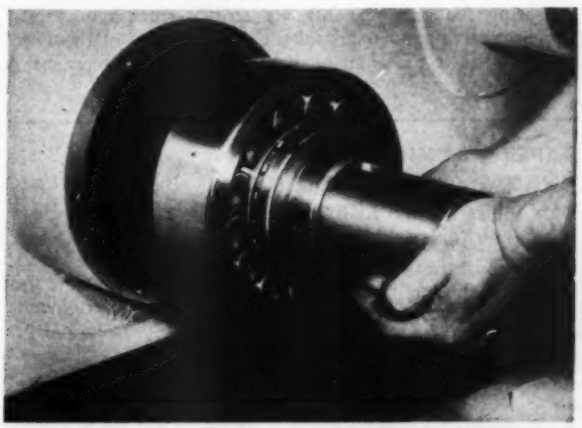
Torrington Spherical Roller Bearings carry gyratory loads in IMPCO Vibratory Deknotters



Knots and foreign matter are efficiently screened from paper pulp by the Vibratory Deknotter built by Improved Paper Machinery Corp., Nashua, N. H. The spring-mounted unit, with its perforated plates, is made to vibrate by unbalancing a shaft rotating in Torrington Spherical Roller Bearings.

An exploded view of the shaft mounting is shown above. Off-center weights at the end of the sheave set up a sharp vibration as the shaft rotates at 1650 rpm. Accepted stock passes through the screen, rejected material is discharged. Load on the two Torrington Bearings is 6000 pounds.

Installing rear bearing. Free-running alignment is maintained despite shaft deflection that might arise from the gyratory motion. The full load-bearing contact area of Spherical Roller Bearings is always uniformly available. Binding stresses cannot develop, so long service life is assured.



Unit design and easy access make the Spherical Roller Bearings easy to install and service. The front bearing, above, is mounted on the shaft and slipped into the housing. Self-aligning Spherical Roller Bearings "true up" automatically, giving perfect initial alignment without adjustment.

These features, plus the high capacity, smooth operation and freedom from wear of Spherical Roller Bearings, assure reliable, long-lasting performance in paper mill equipment. Let our engineers help you adapt them to your machinery. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities of United States and Canada.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

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Ohio. He advances to this new position from the post of director of purchases which he has held for eight years.

▼

PACKARD LEAVES BAGLEY-SEWALL; IS NOW OFFICIAL OF HOLYOKE MACHINE CO.

Several important personnel changes recently took place in the Holyoke Machine Company, Holyoke, Massachusetts. Roland A. Packard, formerly with Bagley & Sewall Company, Watertown, New York, has been appointed executive vice president and general manager, and will also serve as a director of the company.

Attorney Nathaniel M. Harvey of Springfield, Massachusetts, succeeds the late Raphael Sagalyn as president of the company. He has also been named to the board of directors.

Announcement of these changes came from Julian L. Sagalyn, treasurer, who is retiring from that post with Holyoke Machine to succeed his father, Raphael Sagalyn, as president of Industrial Buildings Corporation, Chicopee, Massachusetts. His brother, Irwin Sagalyn, will succeed him as treasurer of Holyoke, and Roger Chamberlain has been re-elected assistant treasurer.

During the past year Mr. Packard has been acting as a consultant and assistant to the president of Bagley & Sewall Company, an activity which he entered upon after leaving Smith Paper, Inc., Lee, Massachusetts, in 1948. During 20 years at the five mills of the Smith company, he organized the firm's first engineering department and supervised expansion programs, including the purchase and erection of three paper machines and the development of the first successful large scale flax pulp mill in the United States. Prior to his association with Smith, Mr. Packard had been with Ludlow Manufacturing Associates, Ludlow, Massachusetts. During his eight years with this company, he spent two years in India as executive engineer of the then new plant of the Ludlow Jute Company.

▼

▶▶▶ *Robie M. Evans,* United States regional forester at Philadelphia, Pennsylvania, will retire on July 31 after 39 years of continuous service in the northwest and northeast sections of the country.

William M. Swingler, now an assistant regional forester at San Francisco, California, will succeed Mr. Evans. A native of Pennsylvania, Mr. Swingler has had extensive experience in the Northeastern Region which he will head, and which includes the fourteen New England and Atlantic states from Maine to Kentucky. Announcement of these changes came from Lyle F. Watts, chief of the Forest Service in the U.S. Department of Agriculture, Washington, D.C.

PAPER MACHINERY MEN ADDED TO ENGINEERING STAFF OF LUKENS STEEL

Three experienced paper machinery men, Robert Ervin, Max Unseld, and A. Reed Schuster, have been added to the development engineering staff of the Lukens Steel Company, Coatesville, Pennsylvania. These men have been engaged to further augment the company's program of design and develment of equipment for the pulp and paper industries.

Robert Ervin, formerly employed by the Union Bag and Paper Corporation, Savannah, Georgia, has had valuable experience as an engineer in the construction and installation of paper mill equipment. He is a graduate of Georgia Institute of Technology with an engineering degree.

Max Unseld came to Lukens from Bagley & Sewall, Watertown, New York, where he was employed as a design engineer. He was educated in Germany and graduated with an engineering degree from Esslingen Engineering College there.

A. Reed Schuster also came from the firm of Bagley & Sewall where he had worked as an erection supervisor. At Lukens he is engaged in the supervision of assembly and erection of pulp and paper mill machinery, and other equipment built in the Lukenweld division of the company.

Robert Ervin

Max Unseld

A. Reed Schuster

▶▶▶ *Roger G. Flaherty,* formerly head of the filter cloth and parts department of Filtration Engineers, Inc., Newark, New Jersey, has been named manager of Filtration Fabrics Division, a newly organized division of the company. Mr. Flaherty will direct both the manufacturing and sales operations of Filtration Fabrics.

▼

WEYERHAEUSER TRANSFERS THREE MEN TO NEW MILL AT SPRINGFIELD, ORE.

Oliver P. Morgan, former assistant chief chemist of the Weyerhaeuser Pulp Division at Longview, Washington, has been transferred to the company's new mill at Springfield, Oregon, with the position of chief chemist.

Also transferring from Longview to Springfield is George A. Hansen, who will be a shift chemist. Mr. Hansen was with Rayonier before joining the Weyerhaeuser development department at Longview several years ago.

Hugo Trygg, shift foreman at the kraft mill, has been promoted to mill superintendent at Springfield. Mr. Trygg came to Longview in 1948 from the Marathon Paper Company. He had previously worked for several years for the St. Regis Paper Company in Tacoma and for the Longview Fibre Company.

Denis R. Axon, a kraft cook at the Longview mill, was promoted to kraft shift foreman, in Mr. Trygg's place. He has had many years of experience in kraft pulp mills and spent several years with the Crown Zellerbach mills in Washington. He came to Weyerhaeuser a year ago.

▼

CHANGES AT ST. REGIS

The appointment of Thomas E. Palmer as assistant to Benton R. Cancell was recently announced by the St. Regis Paper Company, New York. Mr. Cancell is vice president in charge of manufacturing in the company's printing, publication and converting paper division. In addition to assisting Mr. Cancell, Mr. Palmer will also be responsible for new products development and manufacturing, and servicing of customer accounts. His office will be at the Deferiet, New York, mill.

Mr. Palmer is a member of TAPPI and the Superintendents Association, and prior to his affiliation with St. Regis was associated with Reynolds Metals Company in procurement of paper products.

The company also named W. A. Zonner, formerly manager of the Deferiet mill, general manager of manufacturing for the above mentioned division in New York State, to supervise

★

BOB WILLIAMS — PAUL FOSTER
BARNEY BENSON — HOWARD GERBER
HARRY HULMES — CHARLES PENNINGS, Jr.
PETER TALBOT, Jr.

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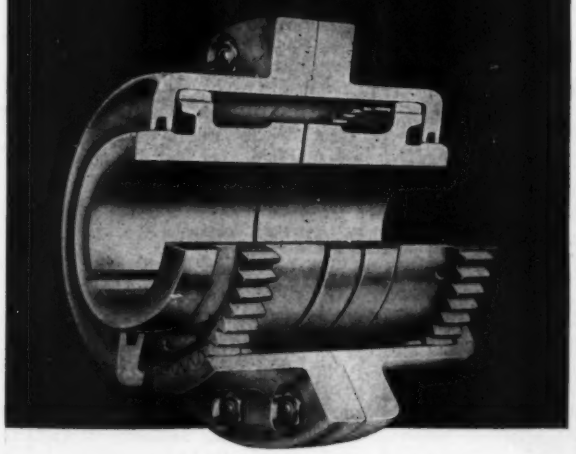
Deckle Webbing
Etc.

★

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

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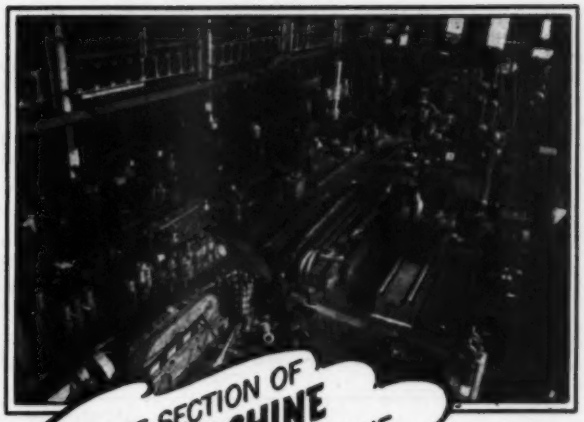

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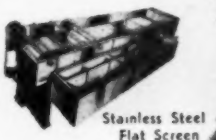
In addition to modern machine facilities we offer the paper industry a complete service embracing engineering, pattern making and foundry operations that are top quality because of over sixty years close association with the needs of paper producers.

Horizontal Axial Flow Agitator

Level vibrating double deck chip screen.



Stainless Steel Flat Screen

Vertical Axial Flow Agitator

Pulp Wood Chipper

Wedenbelt

Quick opening gate valve

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Complete DETAILS

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D. J. MURRAY MANUFACTURING CO. WAUSAU WISCONSIN

mill operations at Deferiet, Harrisville and Norfolk. Assistant mill manager C. H. Plantz succeeds Mr. Zonner as Deferiet mill manager.

▼

▶▶▶ *Clarence W. Daniels,* plants engineer and a director of Norton Company, Worcester, Massachusetts, has retired after 36 years of service. He will continue to participate in the management of the company, however, as a member of the board of directors on which he has served since 1925. Mr. Daniels is the son of Fred H. Daniels, one of the original founders of the company in 1885.

Allan F. Hardy, Jr., assistant plants engineer, has succeeded Mr. Daniels as plants engineer. He had charge of building and equipping the company's recently completed Plant 7.

▼

Richard C. Doane, vice president of the International Paper Company, and Miss Mary Goodfellow, a well-known designer of hats, were married June 17 at Christ Church, Park Avenue, New York, New York. After many years in the New York sales office of the International Paper Company, Mr. Doane was transferred to Canada where he later became general manager of the Canadian International Company at Montreal. The bride is a Montreal woman who, after studies in art and music in Canada and abroad, became a well-known designer with a notable clientele in Montreal and New York.

▼

▶▶▶ *Robert S. Aries,* New York consulting engineer and adjunct professor of chemical engineering at the Polytechnic Institute of Brooklyn, is on a business tour of Mexico, Guatemala, Jamaica and Cuba. Traveling for American interests, Dr. Aries will survey some of the chemical, forest products, and sugar industries in the area.

▼

▶▶▶ *Dr. J. E. Foote* recently joined the E. B. Eddy Co., Ltd., Hull, Quebec, Canada, as mill manager of the company. Dr. Foote was formerly assistant general manager of the pulp and paper section of the B-F-D division of the Diamond Match Company with plants located at Plattsburg and Ogdensburg, New York.

▼

▶▶▶ *Carl E. Staley* received congratulations last month on completion of 25 years of service with the D. J. Murray Manufacturing Company, Wausau, Wisconsin. He has been general manager since 1930 and an executive vice president since 1942.

▼

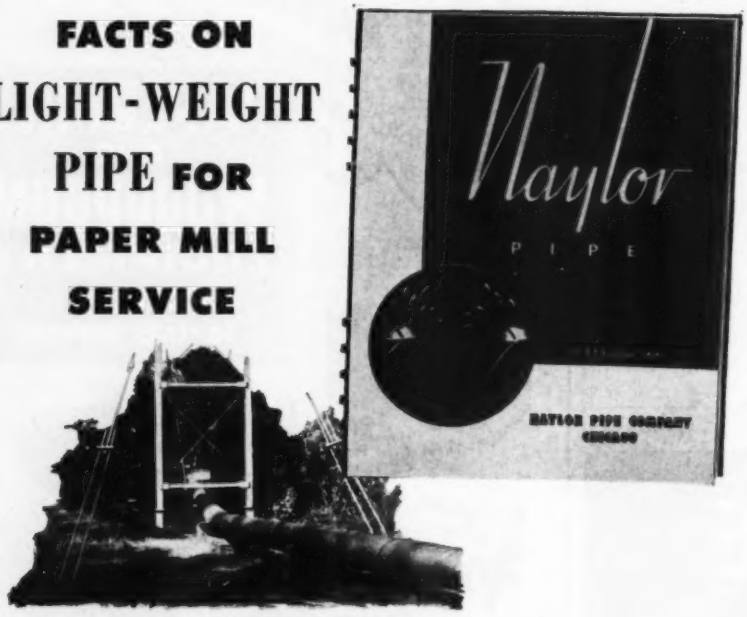
S. G. Ketterer has been appointed Philadelphia district sales manager by Schutte and Koerting Company, Philadelphia, Pennsylvania. Mr. Ketterer is a registered professional chemical engineer in Pennsylvania and New Jersey. He is a member of long standing in the American Society of Chemical Engineers and is a charter member of the Instruments Society of America. He has been with Schutte and Koerting Company for 27 years.

▼

▶▶▶ *F. M. Urban,* formerly merchandise manager of the mechanical goods division for the United States rubber Company, New York, New York, has become sales manager of engineered rubber products for the company. Mr. Urban joined the company in 1929 as a salesman in the Chicago office. In his new position, he will make his headquarters at the Fort Wayne, Indiana, plant.

H. Leon Moran simultaneously was named factory manager of the Fort Wayne plant. Mr. Moran formerly was manager of engineered rubber products in Fort Wayne. He has been with the

FACTS ON LIGHT-WEIGHT PIPE FOR PAPER MILL SERVICE



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company since 1922, progressing through various positions in the Cleveland and Passaic (N. J.) plants as well as Fort Wayne.

▼

▶▶▶ *George S. Dively,* president and general manager of Harris-Seybold Company, Cleveland, has been elected a director of The American Management Association, according to an announcement made June 8 following the Association's annual business meeting in New York. He was elected for a term of three years. For the past two years Mr. Dively has served as vice president in charge of production for the AMA.

▼

▶▶▶ *Edwin R. Bartlett,* president, Hooker Electrochemical Company, was elected a board member of the National Industrial Conference Board at its 33rd Annual Meeting held at the Waldorf-Astoria Hotel, New York. The Conference Board is an independent, nonprofit organization which gathers, tests, distributes, and explains facts essential to the establishment of management, labor, governmental and economic policies that accelerate industrial progress and thus promote the prosperity of the American people. The Board's work is supported by more than 3,000 business concerns, labor unions, government bureaus, libraries, colleges and universities.

▼

▶▶▶ *Warren M. Pike* will handle sales for the Farrel-Birmingham Company, Inc., (Ansonia, Connecticut) as their New England representative. His offices are located at 274 Franklin Street, Boston 10. Mr. Pike will handle the sale of gears and gear units.

▼

▶▶▶ *Alfred J. Kroog* has been appointed sales representative for the Electric Machinery Mfg. Company (Minneapolis, Minnesota) in the state of Georgia. Mr. Kroog represented General Electric for seventeen years prior to the war, and after service in the Navy, he established his own business. His office is located at 902 West College Avenue, Decatur, Georgia (Atlanta); telephone Dearborn 4477.

▼

▶▶▶ *J. D. Greensward* was recently appointed general manager of the Norwood, Ohio, works of Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin. He succeeds Frank H. Stohr who passed away last March. With the company for more than 25 years, Mr. Greensward has served as assistant for the past three years to W. C. Johnson, executive vice president in charge of the general machinery division.

▼

▶▶▶ *Albert G. Naudain* has been promoted to assistant to Leonard J. Doyle, vice president in charge of bag and paper sales, at the Union Bag & Paper Corporation, New York City. Mr. Naudain joined the company in 1938, and since 1942 has handled sales of multiwall bags in the southwestern section of the United States.

Necrology

ELMER Z. TAYLOR

Founder of the Mono Service Company of Newark, New Jersey (acquired by Continental Can Company in 1944), Elmer Z. Taylor passed away at his home in East Orange, New Jersey, May 20. Up to the time of his passing, he had served Continental as a consulting engineer.

Essentially an inventor, Mr. Taylor very early in his career became interested in the handling and converting of paper, and is responsible for such developments as rotary cutters to make business cards, automatic paper bag-making equipment, and a toilet paper perforating and winding machine. In 1907 he designed the paper food container and the machinery to make it upon which his company was built, and established plants to make Mono cups in ten countries throughout the world.

▼

WILLIAM H. FRICKER

General sales manager of the M. D. Knowlton Company, Rochester, New York, William H. Fricker, passed away June 20 at the age of 58.

Mr. Fricker had been connected with the Knowlton Company, manufacturer of paper box machinery, since 1913. Later, as a salesman, he called on practically every paper container manufacturer in the United States as well as many in Canada and Alaska. Since 1931 he had been general sales manager.

Active in the various trade organizations connected with his industry, Mr. Fricker served as vice president and President of the National Paper Box Suppliers Association, as well as serving on its board of trustees. He also was a member of the board of Directors of the Gummed Industries Association of New York.

▼

COLEMAN H. WAITE

Active in the paper industry for more than 60 years, Coleman H. Waite passed away at his home in Orange, Massachusetts, on June 18. He was 82.

In 1884, at the age of 17 Mr. Waite became an office boy in the old Beebe-Holbrook mill in Holyoke, and later in the eighties he was employed by the Platner Porter Company, Unionville, Connecticut.

From 1891 until the formation of the American Writing Paper Company a few years later, he was with the Gill paper mill in Holyoke, Massachusetts, which was absorbed into the Eagle-A organization. In the early years of the century Mr. Waite was successively manager of the Newton Paper Company and treasurer of the Taylor Logan Company in Holyoke.

With the late George Walker of Holyoke, he bought control of the Erving Paper Company in Erving, Massachusetts, in 1916. Under the Walker-Waite management the Erving mill was improved steadily until it became an important unit in the napkin industry. In 1940, Mr. Waite retired as treasurer, selling his interests to Morris Housen.

▼

PHIL A. HOWARD

Well known in the paper industry for more than thirty years, Phil A. Howard, founder, president, and publisher of the Howard Publishing Company, 111 West Washington Street, Chicago, passed away suddenly June 24. Mr. Howard was 70 years of age.

The Howard publications are devoted to the paper industry. *The American Paper Merchant* was founded in 1920; *The American Paper Convention Daily,* founded 1922; *The Source of Supply Directory,* founded in 1924; *The American Paper Converter,* founded 1933; *The American Boxmaker,* purchased in 1945, and *The American Boxmaker Directory,* founded in 1948.

Mr. Howard was one of the founders of The Paper and Twine Association, an organization devoted to the wrapping paper industry.

Survivors include a son, Phil W., of Kansas City, Mo.; and a daughter, Mrs. W. P. Barber, of Oak Park, Illinois.

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400	*G.E.	IK	1800
400	*Westg.	CS	1800
350	*Westg.	CS	900
350	Al.Ch.(New)	ARW	900
300	G.E.	IK	900
300	G.E.	K-559BZ	1200
250	*G.E.	IK	600
250	*G.E.	IK	900
250	*Westg.	CS	1800
250	G.E.	KT-559	1800
200	G.E.	IK	450
200	Westg.		600
200	Westg.	CS	720
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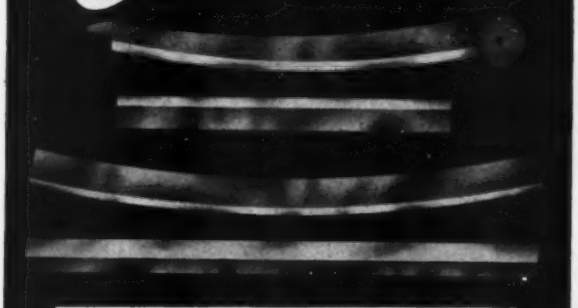

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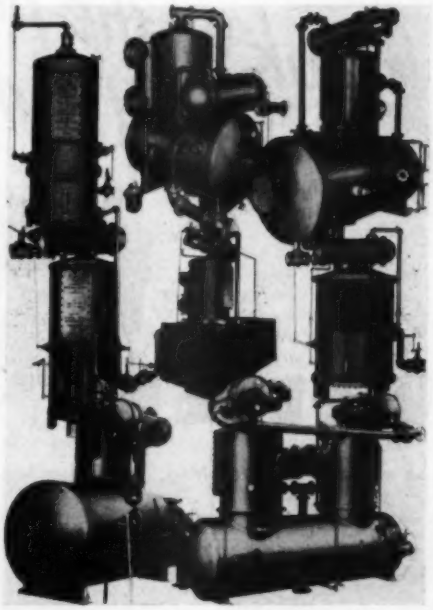

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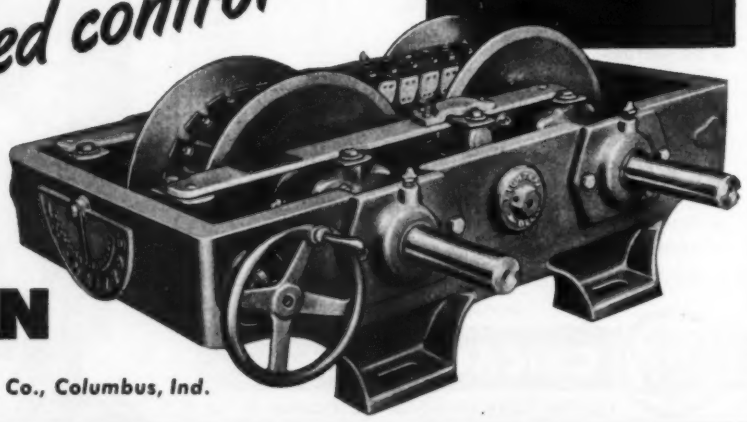

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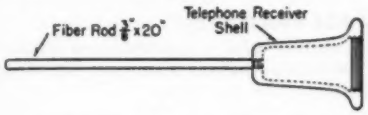
Practical Shorts . . . . . .

Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Stethoscope for the Maintenance Doctor

A simple, homemade maintenance tool can be used for determining what goes on inside a ball bearing. It is easy to make, and with a little experience, is easy to use and evaluate the results. The only items required are a piece of fiber rod ⅜ inch in diameter and 20 inches long, threaded at one end for a half inch with a standard ⅜ inch thread cutting die, and an old telephone receiver shell with a ⅜ inch tapped hole in the small end.



If an old telephone receiver is not available, obtain a fiber or micarta tube 1½ inches in diameter and 6 to 8 inches long. Turn a hard wood block to fit one end and drill and tap this block for the ⅜-inch fiber rod.

In operation, the end of the fiber rod is placed against the bearing housing and the ear is placed against the open end of the receiver or tube. After a short time the operator becomes proficient in distinguishing between the noises that mean trouble and those that denote normal performance.

A steady hum indicates that the bearing is ok. If bearing is dirty, a click will be heard at irregular intervals. If flat spots start to develop, there will be a click at regular intervals and this click will get progressively louder as the wear increases. A crack or fatigue spot on the inner or outer races will also show up as a regular click.

As a matter of interest, the man who developed this tool tells us that it is so sensitive that after a little practice the moving grease can be heard when the bearing has been over-lubricated.

There are about four or five noise levels that the operator soon gets to distinguish and from which he draws his conclusions of what is wrong and about when the bearing should be cleaned or replaced.—T. W. Widmaier, Westinghouse Electric Corp. From *Maintenance News*, published by Westinghouse Electric Corp.

▼

Do You Know Strength of Hemp Rope? Cotton Rope? Steel Cable?

This writer finds that most users of rope and steel cable don't know the relationship between the size of the rope and its strength. They know that a large rope is stronger than a small rope, and that's about all. It is therefore believed that the following rules will be welcomed:

For cotton or hemp rope, square the diameter of the rope in inches and multiply the product by 200. Thus for a ½-inch rope we have ½x½x200 or 50 pounds, which is the safe strength.

For steel cable, square the diameter of the cable in inches and multiply by 12,000. Thus for a 1/2-inch cable we have ½x½x12,000 or 3,000 pounds, which is the safe strength. Do not apply this latter rule to iron rope. Iron rope is not as strong as steel rope.—W. F. Schaphorst, M. E.

▼

Make Tough Jobs Easy

Three key steps for producing strong bronze welds: (1) prepare the edges, (2) line up the parts, (3) use proper preheat. These are key steps in any welded repair. To make tough welding jobs easy for yourself follow these steps in your welding procedure. Here is how one welding shop used these keys to produce a bronze-welded repair that was as strong as the original metal.

The cylinder from a hoisting engine froze up during a cold spell. It cracked badly and one section broke out completely. The crack was veed to a 90 deg angle by grinding and chipping. Then the vee was continued for about 2 inches beyond the visible end of the crack and the broken section was tack-welded in place. Two tack-welds were made and a jack and chain arrangement was used to force the section into exact alignment with the casting. The third tack-weld was made and the jack and chain removed.

It was decided that the cracked end of the cylinder should be preheated before final welding. A temporary firebrick furnace was built and the casting was heated in a charcoal fire to a temperature of 800 deg Fahr. A temperature-indicating crayon was used to show when the proper heat was reached.

When the casting was removed from the fire it was set in position so that the section to be welded was horizontal. The operator then bronze-welded the crack in the broken section, taking about one hour for the job. Note that the finished weld is wider than the vee. The operator took care to lap the weld over the edges for additional strength. Also note how cleanly the vee is prepared. After the welding, the cylinder was covered with asbestos paper to keep off drafts. It was allowed to stand overnight and was ready to return to service the following morning.— From *Linde Tips*, published by The Linde Air Products Co.

Fig. 1—The broken edges were veed to a 90 deg angle

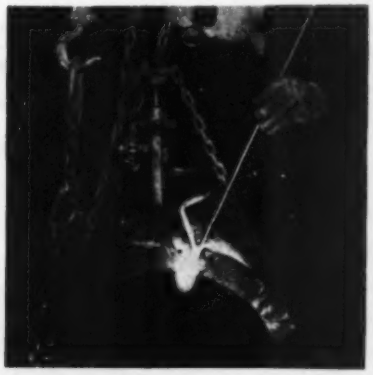


Fig. 2—After two tack-welds were made, a jack and chain arrangement helped to force the section into exact alignment with the casting

Fig. 3—Here the operator is starting the final weld. The end of the cylinder on which he is now working was preheated to a temperature of 800 Fahr. in a temporary firebrick furnace

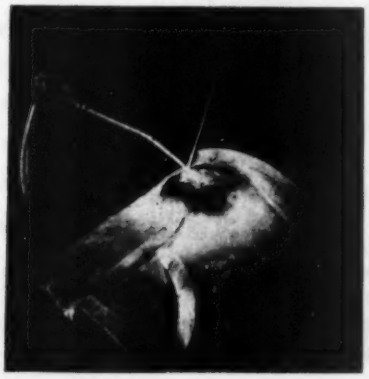


Fig. 4—This is the completed job. The bronze-welded repair is as strong as the original metal

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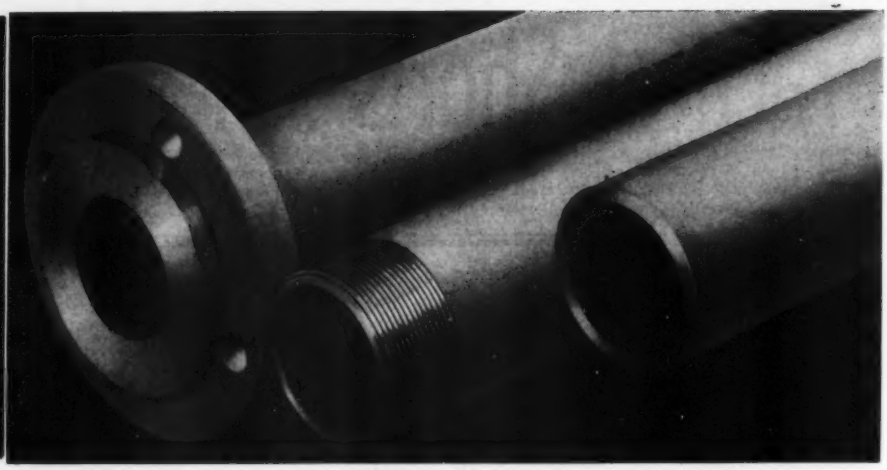

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International Review.....

News from Other Countries . . Technical Developments Adapted from Foreign Literature

British Paper Notes

May, 1949

▶▶▶ NEWS HAS JUST BEEN received by the British paper trade of the arrangements for the next license period, July to October. In many quarters it was hoped that license periods would be discontinued or at least extended from four to six months but there is as yet no indication that this is to be put into effect. However, the continued improvement in the papermaking material supply position is reflected in considerably increased quotas for all the chief paper grades.

Newsprint has been moved up from 50 to 55 per cent of prewar and mechanical papers from 50 to 75 per cent. The latter is particularly significant for up to quite recently supplies of mechanical pulp were not coming forward so well as the pure wood pulp. Production of wallpapers is to be raised to 90 per cent of prewar, wood-free papers from 50 to 70 per cent and M.G. posters the same, while many of the specialized wrapping papers are to be similarly treated as also are some of the paper board grades.

No doubt a large proportion of these extra quotas will be consumed by the heavy increase in permitted production of periodicals, also to operate from July, but there is still a fair way to go before consumption equals the 1939 rate as some usages are still restricted. Production on the other hand, during the first quarter of the present year has reached 80 per cent of prewar, representing approximately 2,080,000 tons of paper and board per annum. Certain qualities, such as general printings and writings are still lagging behind, but paper boards are actually being manufactured at 20 per cent above 1939 and the present rate of production of newsprint is twice that of the first quarter of 1948.

Generally, the British paper trade at the moment seems to be in a bewildering position. While there appears to be plenty of paper about despite production being under prewar, a certain percentage of consumption is absent, owing to restrictions, and this is coupled with a lack of purchasing power which is restricting sales. Yet the abundant supply of paper is mainly in the hands of a few large merchants and printers, and a comparatively short period of steady sales will quickly eat into stocks. At the same time, making orders are taking several weeks to execute and here the trouble is shortage of labor in the sorting and packing sections of the mills.

Concurrently, dissatisfaction is still being expressed at the government's bulk buying of papermaking materials and a series of questions have been asked in Parliament. The President of the Board of Trade was requested to state when the Government intended to get out of the business of pulp purchase for the paper mills and the reply was "not yet." Challenged whether it was not correct that the true market price for pulp (mechanical) was £18 ton, whereas the Government was charging the mills £26-10-0 ton, the reply was that the argument would be the other way round if the Government had not bought sufficient. Statements had been made that stocks of mechanical pulp had been held so long that fungus was already growing on the pulp.

At the same time the position in the wastepaper market has changed completely over the past few weeks particularly in respect to the lower grades of waste paper where orders have fallen off and stocks are rapidly accumulating at the merchants.

Despite the fact that the paper supply position has almost produced a free market, the Control is continuing its demands for form filling, and apart from the usual run of stock returns a new form is being addressed to the larger printers and paper consumers to ascertain stocks available in the country.

Finally newspapers generally are hoping to be granted a further increase in size during the second half of the year, but if newsprint remains at its present high price it is doubtful if newspapers will be able to afford the extra pages.

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Australian News

Thomas Owen & Co. (Aus.) Ltd.—600 tons of new machinery have arrived in Tasmania for the new paper mill which is being erected by this company.

American Newsprint Allocations—Dollar allocations for North American newsprint for Australia cover 10,000 tons January-June, 1949, 35,000 tons July-December, 1949, and 5,000 tons January-June, 1950. A portion of the 35,000 tons in the second half of this year, however, will come from the United Kingdom under the Newfoundland-Bowater deal.

Newsprint 350 per cent Higher—Reviewing problems of the Australian press, Eric Kennedy, president of the Australian Newspaper Proprietors' Association, told the semi-annual conference of the association which was held in Sydney recently, that newsprint was now plentiful, but the average price in Australia was 350 per cent above that of 1939.

Describing the abrupt change in the newsprint position in the few months since the abolition of newsprint rationing from sterling areas, Mr. Kennedy pointed out that the import of Canadian newsprint, which was the cheapest, was still limited by the scarcity of dollars. He said that newsprint from the sterling areas should become progressively easier to obtain, but that it would continue to be very costly during this year. Optimistic forecast was that the price will be much lower next year. He also stated that in 1950, the hard work and courage which established the Australian newsprint mills in Tasmania will be fully rewarded by August, and that the output should be increased from 30,000 tons to 80,000 tons a year.

▼

Cartiere Burge Mills in Italy to Be Modernized With Aid of Marshall Plan

Use of Marshall Plan funds to help pay for a project to modernize and integrate the Cartiere Burge paper mills at Verzuolo and Corsico, Italy, has been approved by the Economic Co-operative Administration. This announcement was made both in Washington and Rome on June 17.

This project is part of Italy's industrial recovery program, and it is expected to aid in increasing that country's exports, reducing costs and improving labor efficiency.

ECA has approved the use of $1,650,000 in recovery funds for the purchase of machinery and equipment in the United States. The Cartiere Burge company will furnish an additional one billion lire to meet other costs of the project.

Machinery and equipment necessary for the project include machines and machine parts, electrical motors and equipment, piping valves, vats and various items of special equipment such as machines for groundwood production, fork lift trucks, control instruments and laboratory instruments.

The modernization program is aimed chiefly at increasing newsprint production, and it is estimated that completion of the project will permit an increase in the newsprint output of the two plants from about 210 metric tons per day to 295 metric tons per day.

Cartiere Burge company's output repre-

sents a large percentage of the newsprint manufactured in Italy. It also produces a wide variety of other types of paper including kraft, book paper, rag paper and others.

The company's properties include 11 paper and pulp mills in Italy, a pulp mill in Austria, and a hydrogenerating plant on the Po River.

Foreign Abstracts . . . . . .

Sand in Paper; Its Abrasion of Printing Surfaces

The wear and tear of metal surfaces like type-faces, electros, gravure cylinders, *et al.* are of such importance to the printer that the author has made a study of this type of abrasion and gives warning of its implications. Nickel-plated electros often gave bad impressions after only about 1000 printings, whereas chrome plated surfaces show little signs of abrasion after five million impressions. (The expense of the latter is often very great.)

Whereas the original cellulose is free from abrasive material, papers invariably contain materials that cause wear and tear. Of these, sand appears to be the chief offender (although finely divided alumina, has a polishing action that affects the sharp edges of face types, and titanium oxide also has a decided abrasive action). Strachan on the basis of nearly forty years of experience has shown that the average "sand" content of sulphite pulps is about 0.02%, whereas printiing papers made from such pulps average about 0.2%. The sources of this abrasive are discussed. They may come from river waters used in the mill (at flood seasons), from limestones and from esparto subjected to African sandstorms.

Thus the sand in paper is both water- and airborne; and the latter appears to be the chief source of the trouble. Sand is also a part of the ordinary atmospheric dust in paper mills. Carefully prepared kaolin on the other hand is practically non-abrasive. The author shows that in the course of a year as much as 50 tons of sand in (a sulphite) paper may make contact with printing surfaces. James Strachan. *Paper Market* (London) 1949, 73-4.

Indian China Clays as Fillers in Papermaking

An English China clay has been compared, from the papermaking standpoint with three Indian specimens. Experiments showed that in particle size, and plasticity the Indian clays were inferior to the English clay. The latter had a much higher density, and far less grit than any of the Indian specimens. The percentage loss on ignition in the case of two of the Indian clays was similar to that of the English sample. All four clays were used in making paper from bleached bambo pulp. In each case 10, 15, and 20% clay (based on air dried pulp) was used. Three different ream weights were prepared in each case and control experiments were made with paper from the same pulp to which no filler had been added.

With two of the Indian clays, the retention was approximately the same as for the English clay. The paper strength after loading with clay was quite similar in all cases, irrespective of whether the British or the Indian products were used, and in two cases, the Indian clays lowered the folding endurance somewhat less than did the English clay. The burst factors were nearly the same for all samples, irrespective of whether the native or English products were present. Thus it becomes evident that in the properties of color, percentage retention, and strength properties, Indian clays compare favorably with the English specimen and may be considered suitable fillers in paper and board manufacture. Full tabulated data and graphs are given. M. P. Bhargava and Chattar Singh. Paper Pulp Section, Forest Research Institute. Dehra Dun, India. *Indian Forest Bull.* 134, 9 pp. (Published 1947) (In English).

Developments in Grinding and Groundwood

Previous work at the Institute at Darmstadt is reviewed and some new data have been added. These deal with the development of new groundwood pulps. A special pulpstone and special burring methods are described, which (on a laboratory scale) gave reproducible pulps. The latter could be converted into newsprint *without the further addition of chemical pulp.* Strength properties of the paper actually exceeded those of newsprint produced from a mixture of 80% mechanical pulp and 20% sulphite (by the conventional procedures). Evidently the reason for this improvement is the increase in the percentage of longer fibers in the pulp. This work was done prior to World War II which prevented mill scale applications, there being no large pulpstones of the required type available at the time. Even without such stones however, improvements could be made by auxiliary machinery installed in a German mill by Voith.

Whereas long range experiments are still required before definite conclusions can be reached, the longer-fibered mechanical pulp was markedly increased, thus permitting a reduction of chemical pulp from the initial 17% to 9.5%. A wet strength tester (previously described, *Svensk Papperstidn.* 50, No. 11B, 63, 1947) when applied to groundwood printing papers showed that the machine caused "broke," when the breaking load fell below 70-80 grams. It was also shown that two mechanical pulps with very different individual wet strengths, when mixed, gave wet strengths far different from the anticipated values. As an example, a fine groundwood (A) had an initial wet tensile strength of 50, and a coarse pulp (B) had a value of 20. When these were mixed in the ratio of 75% A and 25% B, the wet strength of the mixture rose to 110. When A predominated, the wet strength was always far above the calculated value. When B predominated, the wet strength was below the calculated value. This finding is of marked interest and a patented commercial process is based on such mixtures. Grinding is carried out as usual, but screening effects removal not only of tailings but serves to separate the pulp into two portions very similar respectively to (A) and (B). Each of these is tested separately for initial wet strength and they are then mixed in the ratio required to give a suitable tensile on the specific paper machine on which the paper is to be run.

In a series of mill runs, newsprint of 50 gram basis weight was run repeatedly on a machine 3.6 meters in width, *without addition of any chemical pulp.* Broke was no higher than when chemical pulp was in the furnish and the presses showed no printing difficulties. The machine speeds were not modified over those regularly in use. The future possibilities of the new methods are discussed. Walter Brecht. *Das Papier* 2, 437-42 (1948). (In German).

Spots and Specks in Paper

Approaching the problem from a papermaker's viewpoint, the authors have devised a preliminary classification of dirt spots in paper. The spot is first examined by transmitted light. If transparent, it is placed in Group I, if opaque in Group II. From that point on a series of sub-groups are developed, depending (in most cases) on well-established tests. All these are outlined in fourteen detailed tabulations.

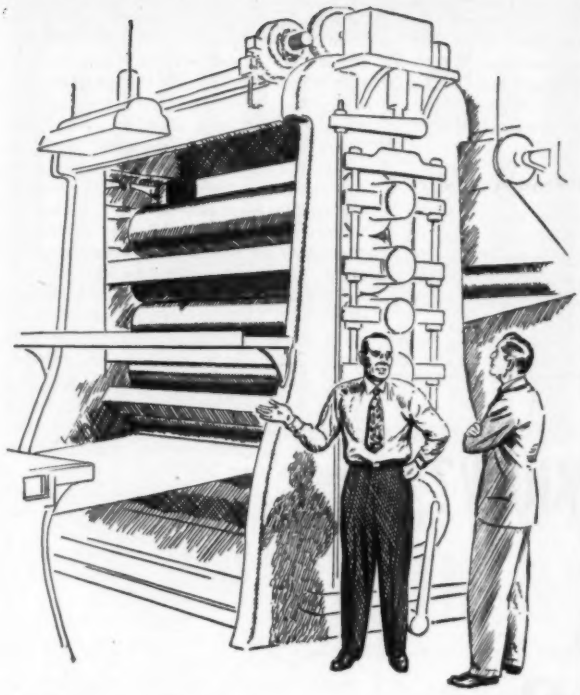
The impurities listed include oils, waxes, greases, rubber, transparent plastics, rosin, pitch, various resinates, starch, slime spots, wood shives, mica, sand, paint, dyes, pigments, coal, various fillers, rust, cinders, sealing wax, various metals (iron, zinc, tin, lead, copper, brass), hair, and oxidized paper (from broke). Thus the authors furnish a convenient "key" for speck analyses. There are times when the spot is assigned to more than one group (i.e., a lime residue which has absorbed grease), but frequently such impurities may be broken down into their classes, at times by tracing the sources of contamination. J. A. Dalton and W. A. Wiltshire. *The Paper-Maker* (London) 117, No. 3, 173-4, 176-9 (1949).

Indian Cellulose—Containing Raw Materials for Rayon Manufacture

Sources of accessible, available, and cheap raw materials have been subjected to laboratory studies, with a view towards determining their usefulness in preparing dissolving pulps.

The materials studied included reeds (both with and without nodes), various species of bamboo, jute, and bagasse. In most cases the materials were crushed and subjected to a preliminary treatment with HCl and with a suitable wetting agent. They were then cooked by a relatively mild soda or kraft digestion and bleached. In all cases, pulp yields, bleach consumption, ash (both in the raw material and in the pulp), alpha-cellulose, "fluidity," alkali solubility, copper no., and brightness were determined. Furthermore, the pulps (from reeds and bagasse) were then converted into viscose films, and these were also tested.

The pulps were compared with a commercial American alpha pulp and with a Swedish sulphite dissolving pulp. The highest pulp yields were obtained from jute (58.86%). This was relatively easy-bleach-



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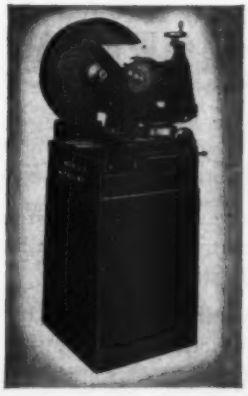

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ing, had relatively low copper number, and had a high degree of brightness. The lowest yield (32.95) was obtained from bagasse. The reeds gave pulp yields of 40-41.7%. Bamboo pulp yields ranged from 35 to 39%. Bagasse pulp required far less carbon disulphide in the subsequent xanthation operation than did the pulp from reeds and also less than that required by the commercial alpha pulp. On the other hand the viscosities of viscose preparations from reed pulps were much higher than those either from alpha pulp or from the bagasse pulp.

Both the viscose films from reed pulps and from bagasse were strong and transparent (with a slight tendency towards "milkiness"). Inasmuch as all preparations were made with relatively primitive equipment, the data (given in extended tables) are promising. M. G. Karnik and D. L. Sen (Indian Central Cotton Committee. Technological Laboratory, Bombay) *Indian Pulp and Paper* 3, No. 4, 169-73, 180 (Oct. 1948). *J. Sci. Ind. Research* (India) 7, 351-6 (1948).

Defibering Wet-Strength Paper

Experiments are described which give the optimum conditions of temperature and *p*H for defibering wet-strength papers, prepared under as nearly identical conditions as possible, but, in one case using a melamine and in the other a urea resin.

The papers (made from kraft pulps) were cut into pieces which were immersed in water containing 2% of the appropriate resin. The temperatures were carefully regulated and so were the hydrogen ion concentrations. Ordinarily, the samples were soaked for 30 minutes. In a few cases the soaking period was as high as 4 hours. There was invariably a change of *p*H in the solution (which sometimes increased, and less frequently decreased). After soaking, the samples were defibered in a 2 liter laboratory disintegrator, and so as to evaluate the degree of defibration, laboratory sheets were prepared containing approximately 25% defibered pulp and 75% bleached sulphite. In such samples it was relatively easy to detect undefibered portions. The results are given in two extensive tables.

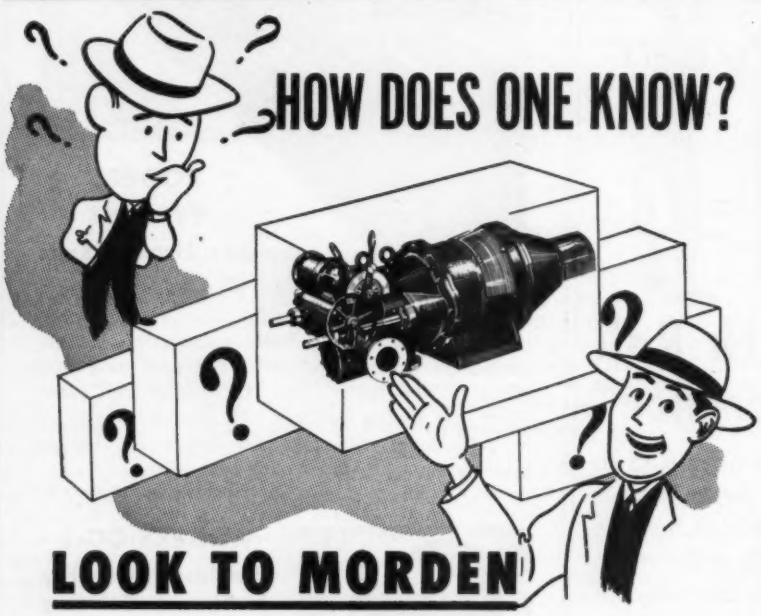
In order to arrive at the same degree of defibering the melamine-treated sheets required a higher temperature and/or a lower *p*H than did those treated with the urea-containing resin. When a temperature of 80 degrees, and a *p*H of about 2 was used for *brief time periods* there was no damage to the fiber. In a few instances (where the pulps had been almost completely defibered) the breaking lengths were determined by the British standard method (at 47 g./sq. m.). These were quite uniform despite wide variations in the preceding treatments. When ordinary rosin-sized paper was completely defibered and then treated in the manner described above, the tensile strength of the test sheet was 65% of the original strength in the machine direction, and 113% in the cross-direction. Corresponding values for sheets containing melamine were (at best) 71% and 125%, and for sheets prepared with the urea resin were 67% and 110% respectively.

At present the reuse of wet strength papers involves practical operating difficulties and increased costs. These might be obviated if synthetic resins were developed which would permit complete and easy defibration of the sheet. O. S. Johansson. *Svensk Papperstidn.* 52, No. 6, 142-4 (1949). (In Swedish with German and English summaries.)

Alcohol Yields in the Fermentation of Sulphite Waste Liquor

An attempt was made to determine the alcohol yields from fermentation of waste sulphite liquor (a by-product of dissolving pulp production) and sulphite distilling slops to which varying amounts of glucose had been added. Fermentations were made both with and without agitation. In some of the experiments a rocking Myrbäck thermostat was used, and some larger scale fermentations were also carried out. Agitation apparently caused a decrease in alcohol yield, a fact which would have to be considered when the "shaken thermostat" is used for routine control in sulphite alcohol production.

When the yeast production was about 0.6 g. (dry) yeast per liter of sulphite waste liquor the yields of alcohol approached 91% of the value calculated from the Gay-Lussac equation: $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2\ CO_2$. The variations in alcohol yields are fully discussed. Six tables; 10 references. Lennart Enebo. *Svensk Papperstidn.* 52. No. 5, 101-6 (1949) (In Swedish with German and English summaries).



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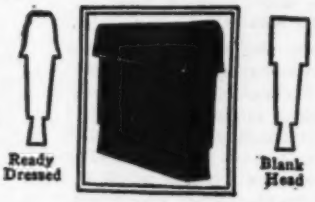

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Groundwood Mill and Screen Room Heating and Ventilation*

S. CLARK

Steam Control and Meter Engineer
Thunder Bay Paper Co., Ltd.

Numerous difficulties have been encountered and overcome till we now believe we have a model system of heating and ventilating in the groundwood mill and screen room at Thunder Bay Paper Co., Limited. The instrumentation feature of the system is unique since it is the first time that Ross Engineering has designed a complete system using the modern indicating and recording pneumatic temperature controllers. The instrumentation of the system is Foxboro.

The system was designed to accomplish the following: a complete grinder exhaust eliminating steaming both on the charging floor, where the magazines are loaded, and on the grinding floor; a screen room exhaust over the three Oliver filters; an exhaust over the bull screen; cooling air for five 5,000 hp electric motors; grinder and screen room heating and ventilating.

It is important to note here that Thunder Bay Paper Co., Limited, is not operating an air conditioning system. Air conditioning cools and humidifies or dehumidifies the air. Ventilating simply takes the air from outdoors and attempts by air changing to make a room reasonably comfortable. However, it cannot cool a room below the outdoor temperature. If the outdoor temperature is 80 Fahr., it will be just as warm inside, or warmer due to the heat from the stock. The cooling air is the outdoor air at 80 Fahr.

Grinder Room and Charging Floor Air Supply and Heating

The first units discussed will be the grinder room and charging floor air supply and heating. These units are shown as a diagrammatic sketch in Figures 1 and 2.

The grinder room air supply fan is set on the charging floor and is equipped with dampers to bring in a fresh air supply or recirculate air from the charging floor. These are steam coils in the unit to heat the air when required. The air is discharged through ducts along the side walls both on the grinder and charging floors by two separate fans, one for each side. Together these fans handle 50,000 cfm, sending 20,000 cfm to the charging floor and 30,000 cfm to the grinder room. This is primarily a fresh air supply and except in the coldest weather air is not recirculated. In the summer this system cools the grinder room and charging floor.

The charging floor heating system draws the heated air from the roof of the grinder room as shown in Figure 2. The air is then either exhausted to the roof or used to heat the charging floor in the winter. The flow is controlled by dampers, and a heating coil is available to supplement the grinder room exhaust heat when necessary.

In the summer the system acts as an exhaust, exhausting the warm air to the roof.

An interesting feature of the control is that steam cannot be turned on until the room dampers are wide open and the roof exhaust dampers are closed.

Motor Cooling and Grinder Exhaust

The ten grinders are driven by five 5,000 hp motors and two fans delivering 50,000 cfm are used to cool these motors. The motor cooling air, besides acting as a protection against overheating, also acts as a fresh air supply for the grinder room. It is important to the air balance in the room that these fans be operated. It will be discussed presently how the efficiency of operation of individual units are related to each other.

The motor cooling duct is a concrete trench under the grinder motors with a supply fan at either end. The fans are equipped with dampers so that the air can be drawn from the outside or recirculated from inside the building. It might be well to note here that all dampers used in the system are the proportional type and are controlled in such a manner that inside and outside air can be mixed to obtain any desired temperature.

Figure 3 shows the placement of these fans, one on the charging floor, the other in the screen room.

The next system to be described is the grinder exhaust. This system is shown diagrammatically in Figure 4.

It is designed to remove all vapors from the stock as it comes off the stone, and to stop any steam rising in the magazine and entering the charging floor. A 60,000 cfm exhaust fan is employed to do this. This fan is rubber coated and the ducts are of stainless steel to protect the equipment from the high humidity in the exhaust vapors.

The stock channels are used as exhaust ducts and vapor is drawn along with the stock and does not have a chance to rise in the grinder room. The exhaust has been extremely efficient and there has never been a trace of steam in the grinder room. To catch any vapors that might rise in the magazines, a duct is located about three feet from the top of the loading point.

The exhaust vapors are removed from the stock and enter an eliminator chamber. This is simply a spray chamber where heat from the grinder exhaust vapor is partially recovered. At present about 500 gallons of water per minute is heated with a twenty degree rise in temperature. This water at present is being used on the Pascol coarse screen external showers.

Instrumentation

The automatic temperature control system is quite interesting, but rather complex. The controls are on the dampers and steam valve. The dampers are set by a single controller and the air can be fresh, recirculated, or proportioned according to the desired temperature.

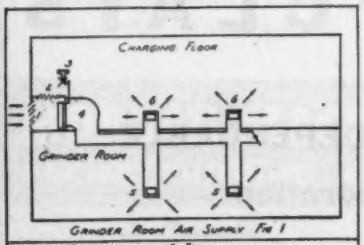
The heating of the air is influenced by two sources, one the room temperature and the other the duct temperature. The room temperature controller and the duct temperature controller are separate instruments which are connected together to operate the steam valve. This controller controlling a controller might appear to be excessive instrumentation. However, a description of the operation should clarify the need for this equipment.

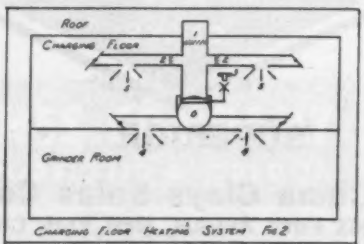
For example, when the room temperature drops more steam is required for heating, the room temperature controller calls for duct temperature controller to raise the duct temperature. The job of the duct temperature controllers is to raise the duct temperature slowly and stop any excessive temperatures in the ducts. If it were not for this duct temperature controller, a slight drop in the room temperature would heat the air to over 120 Fahr. until the room temperature came back to normal. The result would be alternate blasts of hot and cold air and inadequate control. This is the type of heating control used throughout the system.

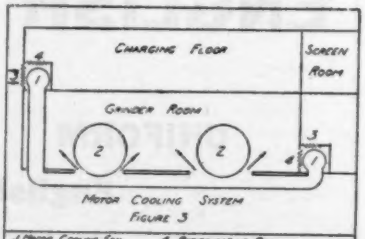
There is one refinement of this control used on the charging floor heating system. It operates the dampers in conjunction with the steam valve and a damper controller is eliminated.

The control and instrumentation of the system is complex and is not easily understood by the average workman. The groundwood foremen are in charge of all adjustments although the control laboratory is responsible for the operation of the system. A routine weekly changing of charts and supervisory checkover is made by the laboratory, and minor adjustments are left to the foremen.

*Abridgment of paper presented at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, Quebec, January 26-28, 1949.







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At this point the importance of maintaining the correct air balance in the system for proper operation should be emphasized.

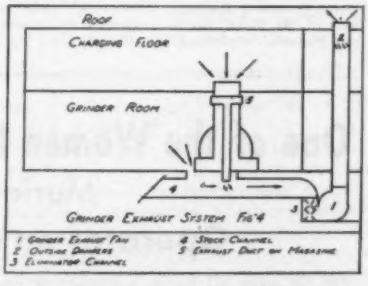
The charging floor was designed to operate under a slight excess pressure. There are no exhausts on this floor except for the air that is exhausted through the grinder magazines to keep the steam from rising. There are two supply units, the charging floor heating supply which recirculates air from the grinder room, and the grinder room air supply which services both floors. Air is supplied at a volume of from 20,000 cfm minimum to a maximum of 70,000 cfm, to maintain a slight excess pressure on the charging floor. This pressure is required for efficient operation of the grinder exhaust.

It was decided at one time last winter to economize on steam by recirculating all the air on the motor cooling and the grinder room fresh air supply. This meant that about 75,000 cfm of air was being drawn from the charging floor.

This changeover was not immediate, but as the weather grew colder more and more air was recirculated. Gradually a wisp of steam rising in the magazines grew to a cloud. Room temperatures did not vary and it was not immediately apparent what had happened to the grinder exhaust. A simple understanding of air balance at that time would have solved the problem. It was a problem with a simple solution, but one which required a complete knowledge of the operation of the system.

The solution was that the recirculation of air had replaced the slight pressure on the charging floor by a slight vacuum. This vacuum on the charging floor was greater than the one exhausting steam from the magazines, therefore it drew the steam from the magazines up into the charging floor. The difficulty was overcome by cutting down on the recirculation of air.

The operation of the motor cooling fans during the summer was a necessity to keep the grinder room temperature down, even though the motors themselves with the fans closed off never approached the danger of overheating. The supply of air was also necessary to balance the grinder exhaust.



It is of interest that the grinder and screen rooms have been constructed without windows, so that open windows do not disturb the air balance as set up. The system has operated efficiently, supplying fresh air and exhausting the steam so completely that the absence of windows has caused no complaint. The mill is well lighted and all equipment is painted using color dynamics to provide the best working conditions.

Screen Room Ventilation

The screen room has presented the most serious problem in ventilating.

As in the grinder room the heating is taken care of by bringing in outside air and heating it as required. The controls are the same—a room controller and a duct controller. The dampers are not controlled and a fresh air supply is used at all times.

There is an additional small heating coil beside the main heating coil on this system. This heating coil is used as a protection against possible freezing of the heating units when the main steam is not required. The control on this unit is operated by the outside temperature. In the winter time this control is set about freezing point. When the outdoor temperature drops below freezing, this small coil heats the unit enough to prevent freezing. This protection is necessary since a fresh air supply is used and no air is recirculated.

There is also a special unit heater in the duct for the roof heating. This is required for additional heating of the air at the roof to prevent condensation.

The most difficult problem in the screen room has been the exhaust over the Oliver filters.

At the time of installation the stock temperatures at the Oliver filters was between 80 Fahr. and 90 Fahr. At that time two groundwood mills were being operated—one an auxiliary mill pumping stock to the main mill about a distance of one mile. The system was not closed and the temperatures were low. After about six months of operation the new grinders were all installed and

operating. The auxiliary groundwood mill was shut down and the stock system became a closed one. Immediately stock temperatures began to rise. The stock temperature at the Oliver filters rose from 80 Fahr. to 130 Fahr. This increase in temperature had not been allowed for in the design of the system. The three 2,000 cfm wall exhaust fans which were satisfactory under the conditions of 80 Fahr. stock became hopelessly inadequate under the new conditions. The evaporation from the stock increased, the temperatures rose to over 90 Fahr. all summer, and the relative humidity was always over 75%. The average dew point was 72 Fahr. and all objects below this temperature sweated. The ceiling sweated, but worst of all the air ducts bringing in the cool air at about 67 Fahr. were dripping water continuously.

The exhaust was inadequate but there remained the choice of three temporary reliefs. The first was to supply the cool outside air and to suffer the continuous sweating. However, the humidity would be lowered and the temperature would be kept about as low as possible—in this case between 80 Fahr. and 85 Fahr. The second was to put the dampers under control and recirculate air until the temperature was over 75 Fahr. in the ducts. This raised the temperature, the humidity and the dew point, but stopped the sweating. The third method was to supply only fresh air but heated to at least 72 Fahr. This raised the temperature in the room but lowered the humidity and it also stopped the sweating.

The mill took the second method since it did not want to use steam during the summer. It did nothing to improve the working conditions except stop the sweating on the ducts.

To understand the problem of evaporation from the stock it must be understood that evaporation varies directly as the partial pressure. The partial pressure of water at 80 Fahr. is 1.032 inches of mercury, while at 130 Fahr. it is 4.525 inches of mercury. This means there will be approximately four and a half times as much water evaporated at 130 Fahr. as at 80 Fahr. The removal of this moisture from over the Oliver filters was necessary. The use of a hood was opposed at first since the operators required access to the filters. However, when the volume of air required to lower the humidity over the filters without a hood was calculated it was realized the amount was so great that adequate fans could not be installed.

With the installation of a hood the fan capacity could be lowered and the use of sliding aluminum doors allowed inspection of the filters when required. At the time of the writing of this paper the hood was in the mill awaiting installation. It is expected that by the time this paper is presented more information will be available regarding its operation.

Pascols

The Pascol coarse screens in the basement of the screen room were located beside the eliminator chamber and the grinder exhaust duct. This duct opens beside the coarse screens and draws the steam off them. This exhaust merely localizes the vapors over the screens. To aid this the screens have been partially boarded in, and any vapor that might escape the exhaust is blown back toward the screens by the basement air supply, which is directed toward the screens.

Technique of Marking Shipments*

E. J. MARSH
Marsh Stencil Machine Company

Twelve million dollars is lost yearly due to failure to properly mark shipments.

Why is marking important? Goods can't go anywhere without an address. Every shipment must be marked clearly, legibly, with the customer's name, street number, city and state. Material of all kinds, for storage or transit, must bear the proper identification marks, description of contents, code marking.

What do people think about the appearance of your shipments? When your goods are delivered to the customer, does he say, "These people know how to mark and pack a shipment properly. I'm dealing with a firm that believes in safe shipping"? Or does he say, "Why don't they learn to pack and mark shipments properly?"

After all, goods aren't really sold until they are delivered safely into the hands of the customer. The value of the merchandise depends upon its arrival at destination in good condition.

(*) Abridged from a talk delivered at the Packaging and Materials Handling "Short Course," jointly conducted by the Industrial Packaging Engineers Association and the University of Illinois Extension Division, at the Hotel Sherman, Chicago, October 4-7, 1948, as part of the Third Annual Industrial Packaging and Materials Handling Exposition.

History of Stencils

The art of stencilling was practiced by the Chinese, Egyptians, and Romans perhaps as early as 1000 B.C. Stencils were first used in making ornamental designs for marking wood, cloth, and paper material, or imitating natural pictorial work upon friezes, panels, and pottery.

The early stencils were made of some tough fabric, paper, or wood. The metal stencils used in commercial trade today were developed within the past 100 years or so.

We have definite knowledge that during our Civil War, 1861 to 1865, stencil cutting was practiced in America. The stencils were used for marking packing boxes and other shipments and were cut in metal about in the same manner as stencil cutters cut them now. The first stencil cutting machine was made in St. Louis about 1892. There are three manufacturers of stencil machines in the U.S.A., and in the entire world. Two are in Belleville, Illinois, and one in St. Louis.

During the war years more than 50,000 stencil cutting machines were produced by the stencil machine industry. Most of these were for the Army, Navy, Air Forces, Quartermaster, and other Government branches.

At the war's end the troops came home, but American-made stencil machines remained in many foreign lands and are helping promote the idea of good marking.

Ways of Marking

Stencil. To stencil mark by brushing over the openings in stencil board cut on a Marsh Stencil Machine.

Print. To form characters similar to printing by using a brush or pen.

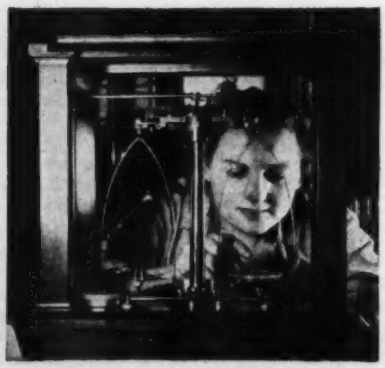
Stamp. To mark with an impression as by a rubber stamp or steel stamp.

Write. To express by means of characters formed freehand as with a pen or brush.

Tips on Marking Shipments

Mark it Plainly. Stencil it with big, bold marking that stands out near-as-print; that can be read by everyone.

Mark it Durably. Use stencil ink that is guaranteed to be water-proof, weather-proof



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Muriel Abrash

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Even the "smallest" phase of our operations is "big" to us; for example, the step pictured here: that of determining the correct analysis of alloys for every type of warp and shute wire.

Here in the laboratory is the heart of Eastwood's manufacturing philosophy: Proper Alloying + Control + Analysis = Quality in Fourdrinier wires.

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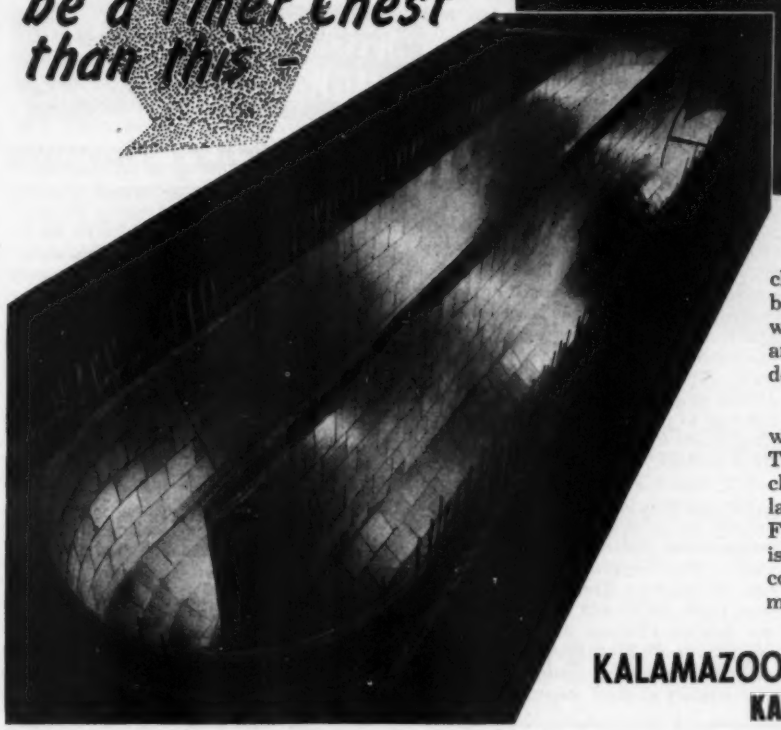

Here is a Kalamazoo Glazed Tile chest in process of construction. It is built of smooth, Kalamazoo Glazed tile with a solid, reinforced concrete core and designed for the installation of deckers on top.

Tanks can be made to any design with sloping floors and rounded corners. The ideal material for stock tanks or chests because of its permanent, long-lasting, easy-to-keep clean surface. Far superior to concrete because there is no chipping or flaking. Standard construction in most modern paper mills.

KALAMAZOO TANK & SILO COMPANY
KALAMAZOO 16, MICH.

and smear-proof. Remember a "lost address" means a *lost shipment.*

Use a Street Address. Marking Rule 6 says, "Addition of a street address will expedite delivery." Take time to make the address complete.

Remove Old Marks. Re-used shipping containers MUST have old marks removed by obliterating paint, by gummed tape over the old mark, or by scraping off the old mark.

Save Your Stencils. A stencil can be used several thousand times; every address is identical, no chance for error. Save your stencils; start a good stencil filing system.

Be a Perfect Shipper. Pack it right—mark it right. Be proud of the appearance of your shipments. Do *your part* to eliminate the unnecessary loss of 12 million dollars a year due to poor marking.

Tools for Marking

The tools for marking are: the stencil, the brush, and the ink. For marking absorbent surfaces such as paper cartons, wooden containers, sacks, and burlap, one grade of ink is used. This ink dries by being absorbed into the surface of the container. A fast-drying ink is used for marking non-absorbent surfaces such as steel, iron castings, metal drums, and machinery. Stencil inks are furnished in black and various colors.

Primer on Stream Pollution*

JESSE M. HOLDERBY[1]

Before it is possible to make intelligent efforts toward controlling pollution, it is clearly necessary to understand what pollution is.

Pollution is clearly defined in the lawbooks. The definition used in the Wisconsin statute is probably as good as any: "The contamination or rendering unclean or impure, injurious to the public health, harmful for commercial or recreational use, deleterious to fish or animal or plant life of the waters of the state."

As a legal term this covers a lot of territory. In everyday language it means that anything put into a stream which is objectionable to either people or fish is pollution. Further, if we recognize that rainfall and snow, acting under the law of gravity, must eventually cause to be carried into some watercourse much of the water-soluble and suspensible material that lies on the surface of the ground; we must conclude that, in the legal sense, one can be guilty of polluting a stream simply by leaving something objectionable in a field or in a yard.

In the main, there are three basic types which may be recognized by their effects on a stream:

(1) *Organic*—Its principal characteristic is that it is usually consumed in the stream by a process of oxidation. Its principal effect, therefore, is to use up oxygen from the water. Under extreme conditions it may use up all of the oxygen that is dissolved in the water, and thus force fish to migrate or suffocate. Under these same conditions also it frequently results in the generation of hydrogen sulphide gas by putrefactive bacteria, with accompanying rotten-egg odors. This oxygen consuming characteristic of organic pollution is scientifically measured in terms of Biochemical Oxygen Demand, usually termed B.O.D. Examples of materials which cause such pollution are: garbage, domestic sewage, wastes from the manufacture of pulp, paper, cheese, other milk products, canned foods, sugar, meat products, beer, leather, etc.

(2) *Inorganic*—This may in some instances be toxic, but usually it comprises simple inert material that settles out when flowed to the stream. Examples of inorganic pollutants are: metal plating wastes and mine drainage, which may be toxic; gravel and sand washings, coal screenings, mine tailings, boiler blowdown, lime sludge from water-treatment plants, and eroding soil from farm lands, all of which merely settle. Some pollutants of this general type are actually organic by the chemist's classification, but are included here because of their general behavior.

(3) *Bacterial*—This type is so categoried because it involves disease producing bacteria. It is the only type of pollution which poses any significant hazard to public health. Its only major source is the excreta of warm-blooded animals, and its only really signifi-

(*) Abridged from a talk delivered at a meeting of the Northwestern Division of The American Pulp and Paper Mill Superintendents Association, Inc., in Appleton, Wisconsin, on May 14, 1949.

(1) Co-ordinator, Sulphite Pulp Manufacturers Research League, Inc., and general manager, Lakes States Yeast Corporation.

cant source is human excreta entering the stream as domestic sewage. To avoid confusion, we must here note that there are many bacteria native to streams, which are harmless, or even beneficial in their effects. Also there are similarly harmless, though sometimes unpleasant, bacteria which come into the water in putrefying organic material of nonalimentary origin.

It should be pointed out that all three types of pollution may occur simultaneously in a stream as a result of a single waste. This fact is undoubtedly responsible for much of the confused thinking on the part of the general public.

Let us now consider the general sources from which pollutants originate. There are four such sources:

(a) *Nature*—Unassisted by man, Nature provides fallen leaves, decaying water weeds, and algae. Even fish and animals become pollutants when they die. Natural pollution is usually mild, but it can at times be quite severe. For example, many otherwise unpolluted lakes and ponds develop on their surfaces such heavy growths of "summer bloom," or blue-green algae, that the odors resulting from its decay make lee shores highly unpleasant in hot weather. On occasion, decay of such algae has been known to result in such a depletion of dissolved oxygen as to result in the suffocation of considerable numbers of fish. Lake Mendota at Madison, Wisconsin, is probably as completely guarded from man-made pollution as any body of water in the world. Yet Madison residents tell of having seen its surface littered with dead fish, as a result solely of oxygen depletion arising from natural pollution. Such severe instances are rare, but they do occur. Less acute but plainly perceptible natural pollution obtains in practically every stream and lake during the season of low-water levels and high water temperatures.

(b) *Domestic Activity*—As people gather in cities, towns, and villages, their activities of normal living produce pollution from garbage and sewage. Instances are many and familiar. New York Bay became so vile that the city had to reorganize its entire waste disposal program. To make the waters of Lake Michigan at Chicago safe to drink after full treatment, the community had to dredge the river and reverse its flow away from the lake. San Francisco Bay is seriously polluted. A substantial proportion of the coast line near Los Angeles is forbidden to bathers because of high bacterial count. So is much of the Massachusetts coast. The severity of such pollution is directly proportional to the population contributing to it. This is not a problem peculiar to any single area. Rather it is peculiar to *people*.

(c) *Industrial Activity*—This form of human endeavor inevitably accompanies civilization and urban population. It produces pollutants in the form of manufacturing wastes. Their importance depends upon the type of industry. They range all the way from highly toxic, such as some metal salts and coal tar effluents; through the merely messy, such as oil and grease; to extremely mild as, for example, condenser water. The vast majority of these industrial wastes are fluids, which have one significant pollutional effect only: they deplete the dissolved oxygen in the stream. The shortage of oxygen drives out fish, it may even kill them if it is severe enough and if the fish cannot swim away. But it presents no hazards to human health. Such wastes create a *fish* problem, *not a people* problem.

(d) *Agricultural Activity*—The ages old and time honored pursuit of farming gives rise to several recognized pollutants. Cultivated land washes out and fills up streams. Fertilizer and manure are spread upon fields; these as well as ordinary barnyard drainage, run substantial amounts of organic pollution and chemical fertilizer into water courses. Many lakes whose shores are intensively farmed offer first-rate examples of how such fertilizer stimulates growth of aquatic plants, particularly algae. Soil wash from farm lands can and does fill streams and bays. Land conservationists urge contour plowing and other sound practices to hold the soil. Stream conservationists should urge these same practices as pollution abatement measures. This type of pollution has been overlooked by many conservationists, but others have stated their belief that it causes more harm than industrial and municipal pollution put together. Spectacular examples are many: the river dredging that the U. S. Army Engineers are continually doing to keep the Mississippi, Missouri, and Ohio rivers, and most bays and harbors navigable; fill-ins behind dams, such as that at Boulder; and the building of deltas at river mouths.

We have now viewed pollution as coming from four main group sources. Of these, only one stems from Nature, and that is perhaps the least significant one of them all. The rest come from human activities—farming, manufacturing, and the basic functioning of life itself. All human activity creates wastes which must be disposed of. And when any waste reaches a stream, pollution results. It is, then, a fair statement that in any populated area stream pollution is inevitable.

In view of the above, you may be impelled to ask, "Why aren't all streams polluted?" As a matter of fact, they all are! And if this be heresy, let me continue along the same heretical line by suggesting that Nature provided streams to serve mankind and that part of their intended service is to carry away man's waste! Streams and lakes are, in fact, Nature's own waste treatment plants. Once polluted, they tend by natural processes to regenerate themselves to almost complete purity. And if pollution load is not too great, physical evidence of pollution may be entirely lacking.

The process by which a stream cleans up its own water is rather complicated. Its main features can, however, be explained in terms which are relatively simple. In surface waters there normally live bacteria and various other organisms of a harmless variety. These tend to kill off the harmful or disease-carrying types which result from human contamination, and they "digest" substantially all forms of organic wastes to harmless, unobjectionable residues. In so doing, they need oxygen as well as organic food. Ordinarily they draw upon the oxygen which is present in the water in solution. So long as there is dissolved oxygen available, the purification process proceeds

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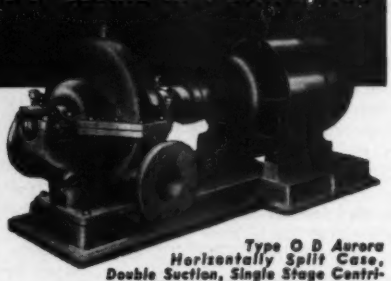

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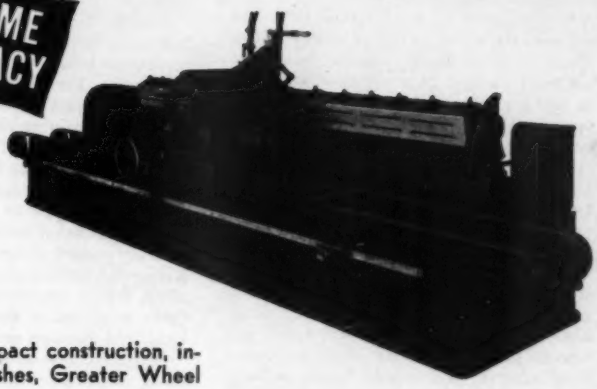

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inoffensively with little or no noticeable effect on the stream.

If, however, the load of pollutants becomes excessive, the accompanying draft on the streams dissolved oxygen assets may totally deplete them. When this occurs, self purification of the stream still continues, but the process is necessarily considerably altered. Because dissolved oxygen is no longer present, the stream organisms can no longer get their oxygen direct from the water. Instead, they are forced to obtain it by breaking down various naturally occurring chemical compounds. The process in this phase liberates the variety of ill-smelling end products which normally accompany putrefaction. Under such circumstances, the stream usually turns black and characteristics develop which, though commonly considered as typical of pollution in general, are actually the result of pollution *overloads* only.

Up to this point we have developed the thesis that, while a degree of stream pollution is well nigh inescapable anywhere in the habitable regions of the world, it is only when the degree is excessive that pollution becomes offensive to man or dangerous to aquatic life. It follows then that any realistic approach to stream sanitation must have as its objective the *control* of pollution rather than its outright abolition.

Control of pollution resolves itself, in most cases, into a problem of either waste treatment or waste elimination. Practical and effective treatment methods for many wastes are known and are widely used. Municipal sewage treatment is perhaps the best-known example. Industry, however, offers many other examples. Food plants often filter or settle out the worst of their pollutional elements. Canneries may pour in chemicals which prevent the formation of offensive characteristics; or they may hold their wastes in ponds or lagoons, discharging it to a stream only after biological forms have consumed most of the food from the fluid. Pulp and paper mills have long used extremely fine screens and settling devices for clarifying fibrous wastes. The oil industry, the milk industry, the steel industry, the meat packers, the distillers, and many others have long employed various treatment methods.

Whenever an engineer is given a waste treatment problem, he must not only figure it out in terms of chemistry and biology, he must consider also the economics involved. The sad truth is that the cost of treatment can be prohibitive, whether to a municipality or to an industry. It often is, and this is particularly true where a high degree of treatment is required to prevent a pollution overload. Actually, with very few exceptions, there are no economically practicable methods for removing completely the polluting constituents of any waste.

Despite years of investigation, there are still some wastes which have stubbornly resisted any effective treatment. And there are innumerable instances where a city, with its industry, still constitutes a considerable pollution source even with the best of waste treatment. If, in the absence of practical methods or in spite of first-class treatment, overloads still exist, they can be avoided only by reducing the quantity of the offending material. Usually this will involve either partial or complete elimination of the source —in brief, shutting down the factory or abandoning the municipal sewer system.

As a brief summary five broad concepts may be restated:

(1) Pollution inevitably accompanies civilization. It is not usually the result of malice or greed or willful disregard of the rights of others. It is the result of *people*.

(2) For some pollutants no practical treatment processes are known, and for substantially no pollutant is there available a method which is 100% effective.

(3) Only when polluted with human excreta is a stream in any danger of becoming a hazard to public health.

(4) Only when a stream is overloaded with pollutants of whatever type does it become offensive to man or dangerous to fish.

(5) Pollution is not simple, it is technically quite complex. Its practical abatement is even more involved.

It is safe to say that almost nobody is in favor of unbridled pollution. The controversy that exists relates to methods and degrees rather than to objectives. Obviously, the situation calls for compromise. Any stream use necessarily involves some degree of impairment. It is as economically unsound to attempt the elimination of all stream pollution as it is unsafe to ignore the problem. The proper balance will be achieved only when the costs of abatement, measured in terms of living standards and payrolls and health, are approximately equal to its over-all benefits.

Taping*

BURTON LEE TRODSON
Mid-States Gummed Paper Company

The proper method of using gummed sealing tape for sealing cartons and packages—like any other proper method—is one of education and "know how."

Cartons come in a variety of sizes, but are generally either square or oblong. They are made of corrugated or fiber board and are really strong. Now all we've got to do to assure a perfect closure that won't come open in shipment is to seal it firmly, securely, and correctly. So we square up the carton first, making sure all seams come together evenly. Be sure the carton is free from dust and dirt which could prevent the tape from sticking. Use a work table that is of convenient height for ease of operation.

Now, measure off a length of properly moistened sealing tape for the center seam of the carton, allowing an overlap of at least three inches at each end. Apply and smooth the tape over and along the center seam with the heel of your hands, pressing the tape down firmly to get a firm bond. Start the operation at the middle and move out toward the ends.

For the edge or side-seams of the carton you also allow for an overlap of at least three inches at each end. Apply the tape so that half of the width is sealed to the carton, the other half rising above the carton edge. Press the tape that is sealed to the carton edge down firmly with the flat of the hands moving from the middle out toward the ends.

Fold the corners or overlap of the tape in and down with the thumbs. Watch this, because such an operation requires a little extra care. Then join the corner angles of the tape to prevent bulges. Finally, fold down the remaining part of the tape to the top of the carton smoothing it from the middle outward, with the flat of the hands.

Repeat on the opposite seam and you have completed one side of the carton.

Turn the carton upside down and proceed to insert or pack the product to be shipped. Repeat the same sealing and closure operations. When completed, you have a carton that's reinforced at the edges, strong, dust-tight, and moisture resistant.

When the glue on the tape dissolves after being moistened with water it forms little hooks or anchors that penetrate into the carton and into the tape. These hooks hang on with a terrific grip, forming a permanent bond. There are two factors which can cause trouble—improper moistening and the human factor—and they go hand in hand.

Gummed sealing tape won't work unless it's properly moistened. To assure yourself of proper moistening it is suggested that an automatic moistening machine be used. They are approved by such organizations as the Association of American Railroads and the Gummed Industries Association. There are many excellent types manufactured.

A good shipping clerk will check his sealing tape dispenser every day. Here is what he will do:

1. Check the water level in the water cup. The water level should never be allowed to get low; otherwise an insufficient amount of water will be transferred to the tape. On automatic tape dispensers this is taken care of automatically by means of a water bottle which feeds into the water cup.

2. The water cup or tank and brushes (if the machine is a brush type—otherwise the roller) are kept clean. A bath of pure soap and warm water keeps them clean and pays off by keeping the equipment in first class condition.

3. If the dispenser is a brush type, the brushes are always inspected because they eventually wear down or become uneven. A worn brush moistens tape unevenly so that the tape sticks in some spots and not in others. Worn brushes must be replaced.

Now, here's something to remember if a pull type dispenser is used. Don't ever pull the tape out at too high an angle. Pull the tape slightly downwards to make sure it contacts either the brush or roller of the machine.

Hand in hand with taping is the necessity to learn how to store gummed tape properly. Gummed sealing tape is packed in bundles. Keep the bundles stored on a platform or in a bin or shelf preferably. If possible do not store bundles on the floor. They may be stored in either vertical or horizontal positions. Keep tape away from radiators, steam pipes or high humidity. For best results store the tape in a room where the temperature is never lower than 60 degrees Fahr. and where the humidity never gets above 60 degrees.

Never open more than one bundle of tape at a time and always take it from the oldest stock first. After removing a roll be careful to tuck the wrapper down over the remaining rolls for protection.

As to package sealing, since there are infinite multitudes of shapes, sizes, and weights it is virtually impossible to provide a method that will satisfactorily serve all requirements. A number of pointers can be given which, if followed, will greatly assist the operator in sealing a package properly.

1. Arrange material that is to be wrapped in an orderly fashion so that the finished package will look either square, oblong or be in the shape of a cylinder.

2. Always seal along the seams of the wrapping paper, chipboard, corrugated board or protective wrapping.

3. See to it that the seam occurs where there is a fairly even, smooth surface in order to provide an adequate amount of surface for adhesion of the tape.

Gummed sealing tape is made in several weights, the standard weight being 35#, 60# and 90#. Basis weight is figured on a ream of ungummed kraft paper 24 x 36 inches. Several weights are manufactured in order to seal properly and protect lightweight, medium and heavyweight packages or cartons. Small units may not require as heavy a tape as a large bulky one. For the same reason, gummed sealing tape is made in several widths.

(*) Abridged from a talk delivered at the Packaging and Materials Handling "Short Course," jointly conducted by the Industrial Packaging Engineers Association and the University of Illinois Extension Division, at the Hotel Sherman, Chcago, October 4-7, 1948, as part of the Third Annual Industrial Packaging and Materials Handling Exposition.

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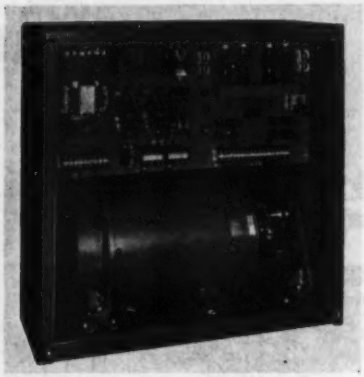


processing at speeds as high as 3000 fpm. It is already used on slitting, side-trimming and shearing lines in the steel industry and on winder reels of paper processing drives, and the manufacturer claims it is adaptable to applications unlimited in number where a position guiding control is desired. Simplified control circuit and use of minimum number of tubes and control equipment results in easy maintenance and continuous operation.

Paving Breaker

Light in weight—built for years of hard work.

Intended for fast demolition work and for use wherever footing is treacherous, the B37 weighing only 38 lb. has been added to the heavier paving breaker line of Gardner-Denver Co., Quincy, Ill. Included in the long life features of this machine are a renewable chuck line, reversible block type pistol type hammer, and use of a tappet, in a renewable bushing, which minimizes wear on the hammer striking face. The new B37 also has the throttle valve lock, which works like the "safety" on a gun, thus enabling workmen to avoid accidents and is especially designed to minimize operator fatigue, having a fast cutting action without violent recoil. An efficient, low-lift plate valve assures low air consumption while the long pistol stroke provides a hard-hitting blow and, the manufacturer states,

the exhaust will not freeze. A quick-acting latch type steel retainer holds the tool securely and an integral oil reservoir meters oil to every working part, including the tool shank.

Filter Cloths that Resist Heat and Acid

For Special Use With Hot Acid

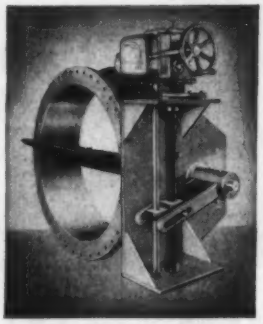
Heat- and acid-resistant filter fabrics are now being made by Filtration Engineers, Inc., 155 Oraton St., Newark 4, N.J.

The new Feinc Vinyon-N fabrics are especially recommended by the manufacturer for use where hot acids are involved. They are said to possess superior resistance to alkalies and bacterial action; they are easy to clean, and are nonblinding. These filter cloths are tailored to fit most types of filters, including all rotary filters; they are available for all types of filters, rotary filters and filter presses alike.

50-Pound Iron Valve

For hydraulic service and controlling the flow of condenser water.

This is a recent development of R-S Products Corp., Wayne Junction, Philadelphia 44, Pa. and is of extremely rugged construction. A limitorque electric motor moves the valve very slowly to prevent water hammer, and threads on the reach rod can be cut to speeds ranging from sixty seconds up to



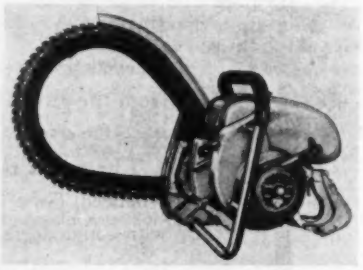
eight minutes. It is fitted with a renewable and replaceable rubber spool for positive 100 per cent shutoff. The company states that this type valve is available in larger sizes, for higher pressures and in materials other than iron.

One-Man Bow Saw

Solves the problems of pinching in the cut.

A new, lightweight versatile cutting unit, known as Disston One-Man Bow Saw, has been announced by Henry Disston & Sons, Inc., 4732 Tacony, Philadelphia, Pa.

The saw is powered by a 3½ hp 2-cycle Mercury gasoline engine and can be used for felling, limbing and bucking under difficult conditions. On the bow saw a straddle type chain travels on an open circular guide rail. An extra long casting of high-strength aluminum alloy keeps branches and underbrush from catching in the top of the chain and gives the guide positive rigidity, an additional safety feature. It is claimed that this feature is valuable in making a felling cut close to the ground or in heavy undergrowth. Another safety feature is the clutch which is disengaged by a squeeze on the handle and quickly re-engaged by releasing a simple safety catch.

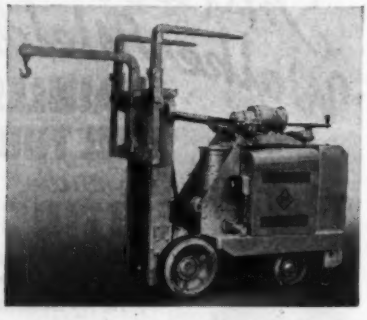


The bow saw includes such features as full precision-bearing construction; specially-designed fuel meter which also acts as a governor to control engine speed; fully protected crank-shaft type magneto; self-rewinding Magnapull starter for quick starting under all conditions; automatic positive chain lubrication; and pistol grip handle on which all controls are located. Maximum power delivered, 4000 rpm.

Truck Attachment

A time-saving device where loads are heavy and vary in shape and size.

Built by Elwell-Parker Electric Co., Cleveland, O., this attachment can be converted from fork to boom in a few minutes without using special tools. It is particularly useful in plants where loads are heavy and in lighter industries generally using fork trucks



but having need at times for moving goods or equipment by means of a boom. Fork and boom can be used together for jobs requiring extra security in handling. Boom extends 36 inches horizontally from base. Fork tines are 36 inches long. Maximum height of lift of boom hook from floor is 30 to 145 inches. Maximum height of fork is 117 inches. Truck's rated capacity, 4000 pounds.

Spray Washer

Designed for a variety of production cleaning requirements.

Detrex Corp., Detroit 32, Mich., has announced a series of new metal parts washers featuring standardized construction

Grind Calender Rolls With Greater Accuracy

HERE'S a better way to grind calender rolls, because it permits greater accuracy. That's by using Oakite Soluble Oil—a combination coolant-lubricant. This double-duty oil keeps the wheels free-cutting, helps prevent loading, and reduces glazing to a minimum. In addition, it keeps rolls from rusting.

Find out more about this widely-used Oakite method and what it can do to make your roll-grinding operation more accurate. Send today for free Papermill Booklet with details on Oakite Soluble Oil. Oakite Products, Inc., 48 Thames St., New York 6, N.Y.

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SPECIALIZED INDUSTRIAL CLEANING

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There is enough bronze being poured here for a hundred centrifugal castings—or maybe not enough for one!

We offer centrifugal casting from 2" length by 3" O. D. all the way up to 328" length by 54" O. D. (world's largest). We make *your* size.

All our castings—from the pigmies to the giants—have these characteristics in common . . . density, uniformity, and freedom from porosity.

Tell your machine builder, "Chief Sandusky."

ON THE JOB—Pouring a Chief Sandusky Centrifugal Casting.

CHIEF SANDUSKY *CENTRIFUGAL CASTINGS*

SANDUSKY FOUNDRY AND MACHINE CO. SANDUSKY OHIO U.S.A.

NEW HIGH-PRECISION BAUER PULPER

End products now being produced from a wide range of materials after defiberization in Bauer disk pulpers.

PRODUCTS HEREWITH — MATERIALS USED ON THE LEFT

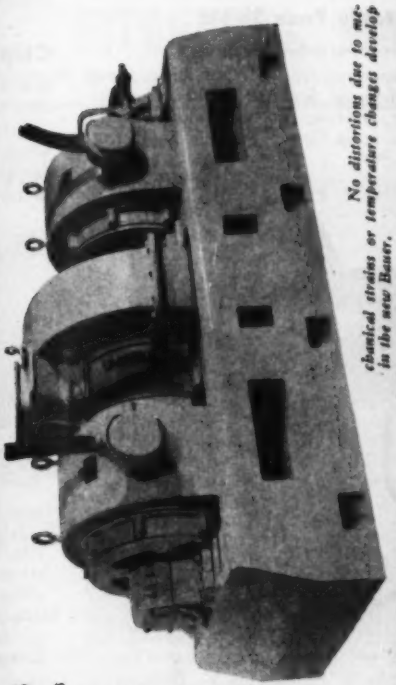
- CONTAINER BOARD
- BOXBOARD
- WALL BOARD
- TISSUES
- TOWELING
- NEWSPRINT
- ROOFING FELT
- LINOLEUM FELT
- SPECIALTIES

FUNCTIONS:

- To disperse pitch and wood dirt
- On de-inking of old papers

So thorough, fast and economical is the action that more and more mills are installing Bauer's.

INVESTIGATE. PERHAPS YOU ALSO SHOULD BE USING BAUER PULPERS.



No distortions due to mechanical strains or temperature changes develop in the new Bauer.

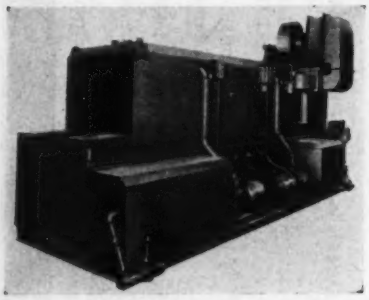
MATERIALS

Groundwood screenings
Sulphite screenings
Kraft screenings
Steamed wood at atmospheric pressure
Steamed wood at elevated pressures
Semi-Chemical pulp
Waste paper
Straw pulp
Asplund fiber
Untreated (green) wood chips
Bagasse

THE BAUER BROS. CO., SPRINGFIELD, OHIO

so that multiple wash, rinse and dry-off stages may be incorporated at minimum cost.

The WB-100-S, single-spray zone-unit and WB-200-S, two-spray zone-unit may be used for ordinary alkali cleaning compounds or converted in a matter of minutes to handle compounds which foam excessively. Spray nozzles are accessible for cleaning and are



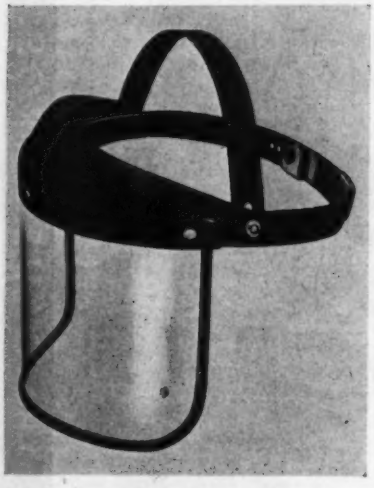
adjustable for direction to any point—top, bottom and sides. Spray headers have removable plugs for easy cleanout.

The blow-off stage for both units may be steam or gas heated or built to give cold-air blast. Rapid cleanout or adjustment of parts can be made through a conveniently located access door and it is not necessary to enter the machine for cleanout purposes.

Adjustable Face Shield

Provides all-around face protection.

An improved type J-1 face shield, especially designed for metal finishing, metal pouring, welding, wood working, etc., is available at the General Scientific Equipment



Co., 2700 W. Huntingdon St., Philadelphia 32, Pa. The head-gear is made of extruded plastic and the visor, fire repellent, flexible, clear Plastacelle is attached to the outside of the spark deflector to withstand greater impact. Can be obtained in three thicknesses and three depths.

Indicating Controller

Provides a selection of six different switching sequences for a large variety of control functions.

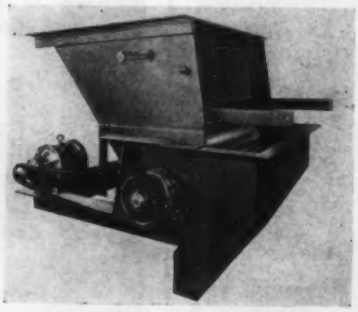
Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill. has developed a

new instrument named Multi-Switch Capacitrol which will become a part of the company's line of controllers for the measurement and control of process variables such as temperature, voltage, amperage, pressure, speed, etc. The controller incorporates such features as a distant view scale, front accessibility, plug-in chassis design and voltage selector plug and is available with a maximum of four switches. A high resistance, fully compensated, direct reading meter movement with Alnico V Magnet is used for applications which fall in the pyrometric range. Models using resistance thermometer measuring systems are available for low temperature operations.

Chip Screen Feeder

Can be installed with various types and sizes of chip screens.

A feeder for use beneath a surge hopper which feeds the screen at a uniform rate and eliminates the need for oversize screens to handle surges was introduced recently.



This machine, a product of Allis-Chalmers, Milwaukee, Wis., is of the rotary vane type and is driven by a chain drive from a gear reducer direct coupled to a motor. Design of the feeder housing permits bolting to the bottom of the user's surge hopper. Engineers of the company claim that its use results in greater efficiency in the screening process.

Bale Truck

Permits one-man handling of 1800 pound, 72" bales.

A new truck which enables one man to handle a massive bale has been announced by Melooz Mfg. Co., 4730 Avalon Blvd., Los Angeles, Calif.

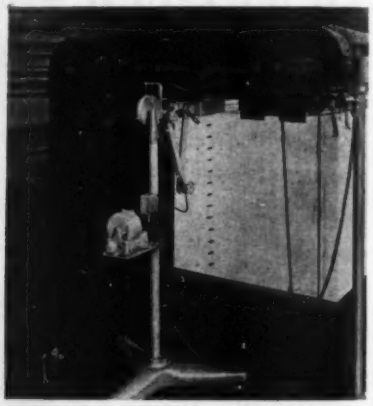
The truck is equipped with a leverage plate, extending 28 in from the axle to the rear casters and terminating in a contoured foot rest. When loading, the operator stands on the foot rest, grasps the top wire and tugs the bale toward him, which automatically loads and brings the bale down to wheeling position. Balancing and carrying the weight of a bale is provided by means of the steel tripod support and rear casters. The short, tapered prong nose of the truck permits easy unloading.

A tilt-and-lock mechanism changes the angle of the truck at will for the best balance and maximum ease in handling any bale, regardless of size or weight. It is claimed that the truck is built to maintain maximum stability in operating over littered, rough, wet or slippery floors, on ramps and inclines, and other difficult floor conditions.

Paper Tab Inserter

Can be used with several types of machinery having automatic pile delivery.

An automatic device for the printing and paper converting industries, designed by Counter and Control Corp., 2737 South Twenty-Eighth St., Milwaukee 7, Wis., inserts paper tabs at preselected intervals in

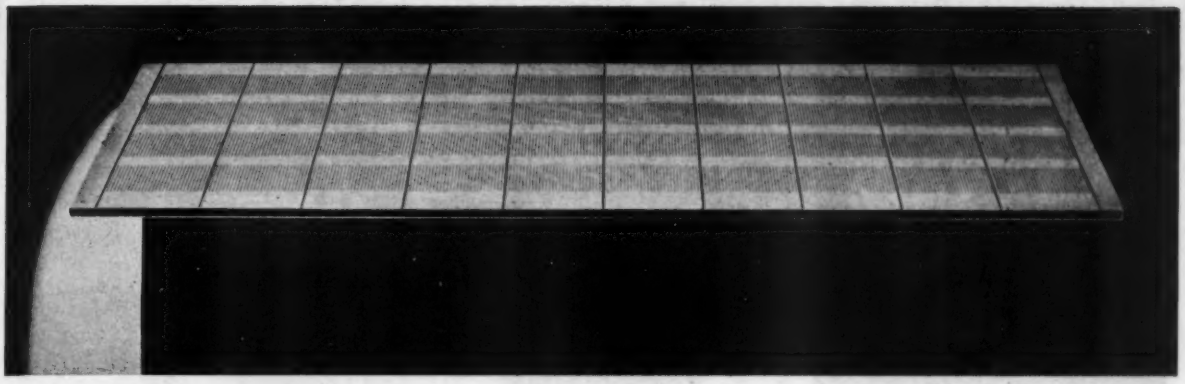


the delivery loads of presses, sheeters and other similar equipment. The inserter is controlled by solenoid actuated CMS Cyclo-Monitor. Counting is done electrically by use of a feather action switch. Two models are available, the portable model C-2 and model C-1 for stationary mounting on the machine.

Acid Container

Spillproof and unbreakable.

To provide safe, splashproof carrying of corrosive solutions, Automotive Rubber Co., Inc., 8601 Epworth Blvd., Detroit 4, Mich.,



The "Hardy" Chrome-Nickel-Steel SCREEN PLATE

OVER 20,000 IN SERVICE

No slot wear in fourteen years! The important sharp top edge and burnished cut remains unaffected by erosion and corrosion. AND DO THEY SCREEN!

MAGNUS METAL CORPORATION FITCHBURG, MASS.

YES! GO WEST! 1949 Fall Meeting TAPPI, Portland, Oregon

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HD

BELT FASTENERS AND RIP PLATES

FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

Flexco HD Fasteners make a tight, butt joint of great strength and durability . . . distribute the strain uniformly. Operate smoothly over flat, crowned or take-up pulleys. Made of steel, Monel, Everdur and Promal.

Flexco Rip Plates are for repairing and patching damaged belts.

Ask for Bulletin F-100

FLEXIBLE STEEL LACING COMPANY
4606 Lexington St., Chicago 44, Illinois

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Order From Your Supply House

SIMPLICITY

NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

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OPERATING
ECONOMY *and*
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A TYPE AND SIZE
FOR EVERY PURPOSE
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has added to its line of utensils a closed type container available in 1, 3, and 5 gallon sizes. Constructed of perforated metal completely covered, body and handles, with ⅛ inch tough, seamless rubber or synthetics to

meet specified uses, no metal is left exposed. Rubber stoppers for top and spout are included. This container, together with the manufacturer's other utensils, is claimed to be the safest, most durable made.

New Flexible Fish Tape

Can be used in all types of conduit, including aluminum.

Ideal Industries, Inc., Sycamore, Ill. has announced a new fish tape called the Coil-Flex. Its round surface is easy on the hands, gives a safe grip, and can be pushed or pulled with little effort through any and all

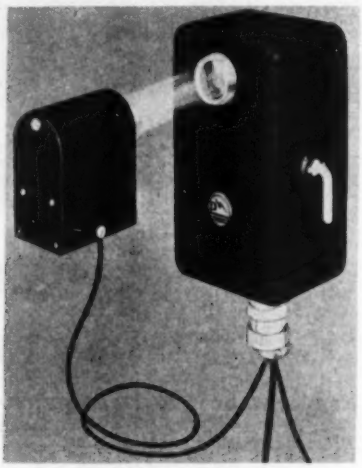
bends allowed by the electrical code thus preventing cutting and damaging of aluminum conduit. It is claimed by the manufacturer that the tape never kinks, snarls, or springs loose all over the job or into moving machinery or "hot wires." The Coil-Flex consists of a 25-foot length of steel spring 11/32-in. diameter with rustproof inner steel cable and is tested at 400 pounds pull.

Photoelectric Control

Indicates jamming of cases or cartons on conveyor lines.

A photoswitch delayed action photoelectric control type 20DA4 has been designed by Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass., which indicates the presence of a jam and provides conveyor stop motion.

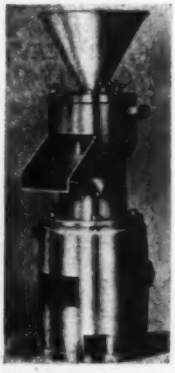
Control and light source are placed on opposite sides of the conveyor and as a case passes along it will interrupt the light beam. When a predetermined time interval has elapsed, representing a longer period than normally for a case to pass by, the excessive light beam interruption indicates a jamming of several cases. The delayed action feature of the photoelectric control is for the purpose of eliminating relay action except when a jam occurs, with the interval adjustable from 1/20 second to 5 seconds.



The entire unit, including housing, is designed for plug-in construction of all electrical connections. Hermetically-sealed, oil-filled condensers and high wattage resistors are typical of components used throughout. The photoelectric control is built to withstand vibration and is easy to install.

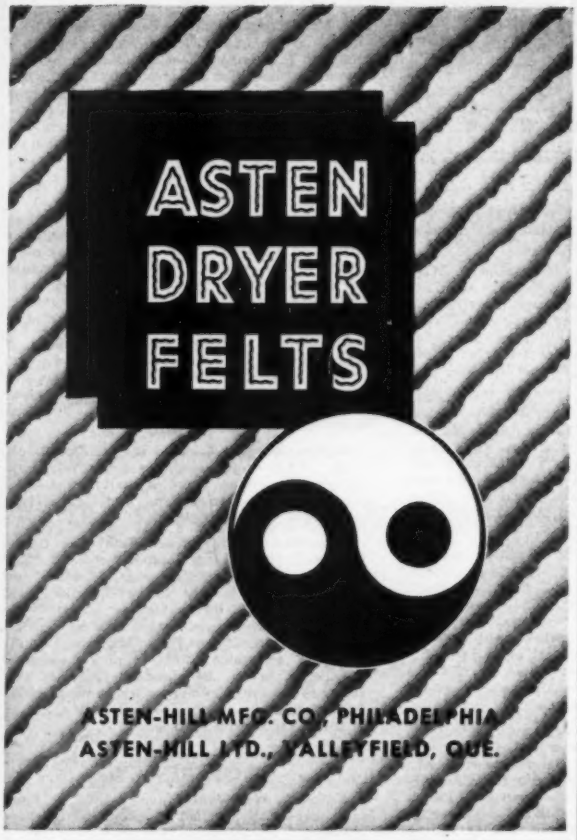
Midget-Size Mill

For custom runs and laboratory testing of chemicals, paints, and similar materials.



A midget - size mill, known as Morehouse Model M, which grinds, emulsifies, homogenizes, mixes, disperses and disintegrates has been announced by Morehouse Industries, 1156 San Fernando Rd., Los Angeles, Calif.

The unit measures only 10 inches in width and 31½ inches in height and weighs 135 pounds. Noteworthy features include specially-built but standard open type 3 hp motor, flex coupling between motor and mill, sealed bearings requiring no lubrication, double-bearing spindle and precision-ground adjusting sleeve which assures perfect alignment between upper and lower stones at all times. Wing nuts on head facilitate quick removal of stones for cleaning or changeover from one material to another. Adjustments for various grind sizes may be made without stopping. All parts are readily accessible and interchangeable.



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For Paper and Pulp Mills

• Carlon E Flexible Pipe solves your corrosion problems. It is particularly suitable for paper and pulp mill applications because it will not rust, corrode or deteriorate in either acid or alkaline waters. It is impervious to practically all inorganic chemicals and completely free from any electrolytic corrosion—it cannot form a galvanic couple.

Thousands of feet of installations under strong sulphurous solutions have served for several years without replacements and no evidence of corrosion or deterioration.

Only 1/7 the weight of steel pipe—easier to handle and install, fewer fittings required. Furnished in standard pipe sizes ¼" to 6" diameter. *Write for prices and information.*

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2. Alpha* Protein is compatible with the various pigments used and binds them to the fiber of the raw stock easily.
3. Alpha* Protein adhesive has a color which does not affect, to any extent, the colors of the pigments used or their hiding power.
4. Alpha* Protein alkaline-cut adhesive permits addition of formaldehyde to coating colors to make the finished paper water resistant.
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7. Alpha* Protein adhesive sets quite rapidly and dries easily without undue shrinkage or interference with the finish when the paper is calendered.

FREE! Concise yet complete, profusely illustrated . . . this valuable new book on Industrial Soya Proteins gives you complete details of the advantages of Alpha* Protein in coating paper. Also has chapters on the use of Alpha* Protein in the Glidden Prosize Process for paper sizing and on the use of Glidden Prosein* in adhesives and binders. Write for this book today!

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New Literature . . . . .

Mixer. Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn.—4 page bulletin No. 1492-3 describes and illustrates the new side entering mixer manufactured by this company. Eleven features are listed, including the stuffing box which is also illustrated. Recommended uses for this unit are given.

Coating Machines. John Waldron Corp., New Brunswick, N. J.—4-page folder describes and illustrates the two laboratory coaters developed by this company. Diagrammatic sketch of each machine is shown.

Smoke Abatment. Eclipse Fuel Engineering Co., Rockford, Ill.—4-page Bulletin KS-1 describes the overfired air jet system of controlling smoke problems. Two methods of installation of air jet systems are illustrated, the single manifold and the double manifold. A selection table to aid in selecting a suitable jet system is included.

Cylinder Calculator. American Type Founders, 200 Elmora Ave., Elizabeth 8, N. J.—16-page vest-pocket size booklet contains tables showing the cylinder diameters for circumferences from 1 inch to 60 inches in steps of ⅛ inch used in commercial rotogravure to determine the length of print for all cylinder calculations.

Material Handling Equipment. Automatic Transportation Co., 91 West 87th St., Chicago 20, Ill.—8-page catalogue describes complete line of material handling equipment manufactured by this company. Pictures of transporters, transtackers, fork trucks, platform trucks, etc., are shown, and specification tables for various type models are given. Six diversified attachments for tiering fork trucks are illustrated.

Polymers. Polymer Industries, Inc., 11-08 30th Ave., Astoria, N. Y.—3-way folder explains the polymer and lists the uses to which this compound is applied. Also listed are the products manufactured by this company for the textile and paper converting industry, plus paper coating compounds and formulated chemical products.

Water Tank. Chicago Bridge & Iron Co., 332 So. Michigan Ave., Chicago 4, Ill.—4-page leaflet describes and illustrates the newly-designed Watersphere, an elevated water tank. A diagrammatic sketch of the unit gives an interior view of its structure. A table of standard sizes available is included.

pH Control. Foxboro Company, The, Foxboro, Mass.—16-page Bulletin No. 430 describes and illustrates the equipment offered by this company for the measurement and control of pH in industrial processing operation. Case histories are cited from numerous industrial fields and the theory applied in actual pH control instrumentation is explained in text and diagram. Various types of pH electrodes available are illustrated, and complete specifications, as well as dimensional drawings, are given.

Ratio Speed Changer. Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.—2-page Bulletin No. 99 describes the miniature variable-ratio speed changer manufactured by this company. Illustration, dimensional drawings and characteristic curves are included.

Control System. Reliance Electric & Engineering Co., 323 Republic Bldg., Cleveland 15, Ohio—2-page Bulletin K-2025 describes the V8C Electronic Excitation Control System produced by this company. Advantages provided by the unit are cited. Also given are the ampere ratings for which it is made, a-c supply voltages for which it is available and other interesting data.

Lift Truck. Barrett-Cravens Co., 4613 South Western Blvd., Chicago 9, Ill.—8-page illustrated Bulletin 4861 describes the three battery-powered lift trucks manufactured by this company. Each unit is described with full specifications. Illustrations include operating views and closeups of advanced electrical and mechanical features. Information on batteries and chargers is also included.

Pumps. Allis-Chalmers, Milwaukee 1, Wisconsin—8-page Bulletin O8B6381C describes the line of Type CW solids pumps. Illustrations include photographs of the pumps, both exterior and interior, and installations. Construction, design and maintenance features of the pump are given along with specifications and dimensions.

Hose. Russell T. Gray, Inc., 205 W. Wacker Drive, Chicago 6, Ill.—Bulletin CMH 100 describes and illustrates this company's Refrigerant Service hose, a charging hose which utilizes a neoprene packed corrugated steel core for gas-tight strength and flexibility. Construction is shown in detail, and sizes and list prices are given.

Protective Coatings. Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y.—8-page Bulletin No. 62 describes metallizing, a method of spraying zinc or aluminum on iron or steel surfaces to prevent corrosion. Twelve photographs illustrate actual application of the product to a variety of parts in different industries. A chart showing the life expectancy of metallized coatings under several corrosive conditions is included.

Suction Rolls. Downingtown Mfg. Co., Downingtown, Pa.—12-page Bulletin No. 349 outlines the principles of water extraction and illustrates the primary water removal equipment manufactured by this company. Photographs of installations of Suction-Extractor, Plain Extractor, Suction Drum Roll, and Drum Press, etc., and tables showing typical mill test results are included.

Blowers. Lamson Corp., Allen Billmyre Div., Syracuse 1, N. Y.—4-page Bulletin B-5-A describes and illustrates the blowers and exhausters manufactured by this company. Pictures of the single and multi-stage blower and exhausters are shown, plus a diagrammatic sketch of discharge positions for sheet metal blowers and exhausters viewed from motor ends.

Switches. Micro Switch, Freeport, Ill.—Two 2-page bulletins describe and illustrate the switches manufactured by this company. Form No. 80-133 is an illustrated description of the BZE-2RN4 switch for manual control and includes a diagrammatic sketch showing dimensions of the unit. Form No. 80-134 is an illustrated description of the OP-AR50 splash-proof switch with plate actuator designed for service in manual control of power operated equipment. A diagrammatic sketch showing dimensions is also shown.

Bearing Bronze. Magnolia Metal Co., Elizabeth, N. J.—2-page leaflet describes and illustrates the Magnolia Isotropic bronze produced by this company. A partial list of stock sizes and approximate weights of bars are included.

Oven. The Miskella Infra-Red Co., East 73rd and Grand Ave., Cleveland 4, Ohio.—1-page Bulletin describes the No. 901 Portable Miskella Moto-Baker for transformer, armature, stator and other windings, produced by this company. Views of the exterior and interior are shown.

Motors. Elliott Co., Jeanette, Pa.—4-page Bulletin PB 5600-1 contains descriptive matter and photographs on Fabri-Steel, high speed, synchronous motors with direct, belt or gear drive produced by this company. Mechanical modifications are also illustrated.

Rotameters. Brooks Rotameter Co., Lansdale, Pa.—4-page loose-leaf Bulletin No. 6 describes and illustrates the Full-View Rotameter with safety shieldiing. Exclusive features, standard modifications, sectional sketches and dimentional tables are given.

Silicon Iron. The Duriron Co., Inc., 17 E. 42nd St., New York 17, N. Y.—12-page Bulletin No. 113, contains new data on silicon iron alloys, duriron and durichlor produced by this company. Included in the contents are tables on chemical composition and mechanical and physical properties, descriptive text on background, design, application, sulphuric acid resistance, corrosion resistance, etc., graph charts on corrosion rates, and a large list of common corrosives in tabular form.

Chemical Engineering Service. R. S. Aries & Associates, 26 Court St., Brooklyn 2, N. Y.—6-page folder-type leaflet entitled "Chemical Process Engineering" explains five steps in setting up a chemical process engineering plan offered by this company. Personnel who handle the commercial chemical development programs are listed, and a list of the fields covered, through aid from this company, are included.

Procurement Service. Trilane Associates, 1 Hudson St., New York 13, N. Y.—A booklet entitled "United States Government Procurement Service," contains answers to commonly asked questions about government procurement.

Welding Supplies. Lincoln Electric Co., Cleveland 1, Ohio—8-page Bulletin No. 467 is a directory of welding supplies manufactured by this company. Illustrations and descriptions accompany the items shown.

Expansion Joints. Chicago Metal Hose Corp., Maywood, Ill.—28-page bulletin entitled "Design Guide to Expansion Joint Selection and Application" is written in non-technical language and contains numerous illustrations, charts and tables and was prepared for the purpose of simplifying the selection and application of expansion joints in piping systems. Detailed data on the standard types of this company's corrugated expansion joints and useful information on proper installation in the pipe line system are included.

BOOK REVIEWS

Finland's Wealth of Wood—Edited by Benj. Helander with English translations by Paul Sjoblom. Photography by Otso and Matti Pietinen.

This simulated board-covered book is about 8 x 12 inches and other than 50 pages of text matter contains 222 pages of superb photographs. The Finnish printed text is followed by an English translation and explains succeeding pages of pictures of the various phases of Finland's huge wood and paper industry from the forest, to the mills and manufacturers and its working people.

The many pages of excellent photography are divided into sections, and so thoroughly do Messrs. Pietinen cover each section the reader will experience an imaginary tour through Finland's No. 1 industry.

Realistic scenes of wooded landscapes show the extent of the great timber resources. Workmen are seen in the lumber camps, felling trees and floating the logs to sawmills.

Logs are converted into lumber, piled for seasoning, and then loaded on barges for shipment. In the ship building industry, hulls are constructed for wooden barges and schooners.

Prefabricated housing employs, both women and men, and in the plywood industries we see plywood being manufactured.

Our photographers take us through 100 scenes of the pulp, paper and chemical by-products industries. Pulpwood is ground, formed into sheets and then baled for shipment. Groundwood pulp, wastepaper and other components are prepared in Hollander beaters and made into paperboard on cylinder machines.

Chemical pulping is made by both the sulphite and sulphate processes. Many views of the equipment and operations give us a vivid picture of the methods employed in this important branch of Finland's industry. Newsprint manufacture is shown in some detail in one of this country's most modern paper plants. Various phases of manufacturing sawmill waste into wallboard are pictured. Chemical by-products such as alcohol and yeast from sulphite waste liquor and pine oil and turpentine from sulphate black liquor are produced.

The final section of the book takes us to the people themselves. Here we have a brief glimpse of the social side of life in the plants and at home, at work and at play, in Finland's working community.

SULPHITE MILL ACID PLANTS

SULPHUR BURNING PLANTS
JENSSEN TWO TOWER ACID SYSTEMS
GAS COOLERS—SURFACE AND SPRAY TYPE
JENSSEN PRESSURE ACID SYSTEMS
JENSSEN AUXILIARY PROCESS TOWERS
RECOVERY PLANTS—COOKING ACID

SOLUBLE BASE ACID PLANTS
SEMI CHEMICAL PLANTS
JENSSEN SO_2 ABSORPTION SYSTEMS

FOR BLEACH PLANT APPLICATION
SULPHUROUS ACID PREPARATION

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Cross section view of GARLOCK Lattice-Braid packing, showing unique structural design.

Here is why *Lattice-Braid Lasts Longer*

The individual strands are braided *through and through* in an entirely different way by specially built braiding machines designed exclusively for manufacturing Garlock Lattice-Braid packing.

All braided strands are strongly lattice-linked together into a structural unit which holds together even when the packing is worn far beyond the serviceable limits of wear of ordinary braided packings. Supplied in several styles, including:

GARLOCK 730 (asbestos)—for hot or cold water at medium to high pressures.

GARLOCK 731 (asbestos)—for steam, gases or water at temperatures up to 700° F.

GARLOCK 732 (asbestos—wire inserted)—for heavy duty service against steam, oil, gases or water at temperatures up to 700° F.

GARLOCK 733 (asbestos)—for hot or cold water or alcohol at medium or low pressures.

GARLOCK 734 (asbestos)—for cold gasoline, kerosene and light oils.

GARLOCK 736 (blue asbestos)—for concentrated mineral acids.

GARLOCK 740 (flax)—for cold water at medium or low pressures.

GARLOCK 745 (flax)—for heavy hydraulic service against cold water.

GARLOCK 751 (cotton)—for hot or cold water.

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PALMYRA, N. Y.

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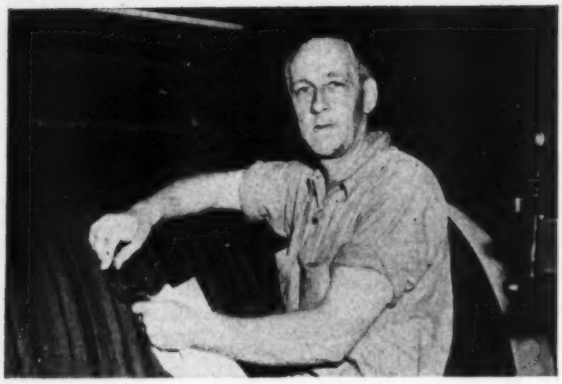

Typical of THE MEN WHO MAKE INDUSTRIAL MAINE

Truman Pease says:

"You hear a lot of talk about the attractions and glamour of working in big cities. Over the years, I have seen many of my friends pull up stakes and try their luck at city life. Then, later, I have seen these same fellows come back to Maine and heard them say: 'Boy, it's good to get back here and really live again!'

"I've come to the conclusion that there is no substitute for the happiness and contentment you get in living and working in a place you like. Yes, I'm glad I stayed in Maine.

"Take my work in the woolen mill. I have worked here for fourteen years and have thoroughly enjoyed it. I get real downright pleasure in seeing fine woolen cloth come from the mill and I take a great deal of pride in the part I do.

"I wouldn't trade my life in Maine for all the bright lights of the city. I have a 200 acre farm, keep a small herd of good cows and cut some wood on the side. Take it from me, Maine is a grand place in which to live, work and play."

Truman M Pease

Truman Pease is typical of thousands of Maine workers who take pride in their work and really enjoy life. Maine has what your industry needs. Nearness to the nation's biggest markets; year 'round production weather; moderately priced power; pure processing water; excellent transportation; fair taxes; no State sales tax; no State income tax.

If you are planning to move, expand or decentralize, it will pay you to investigate the industrial advantages of Maine. Write for free booklet, "Industrial Maine".

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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	6.75 to 7.00
Corduroy, Men's	5.75 to 6.00
Corduroy, Ladies'	5.75 to 6.00
Washables, No. 1	4.25 to 4.50
Percales	6.50 to 6.75
Light Prints, No. 1	6.00 to 6.25
Khaki Cuttings—	
Bleachable	6.00 to 6.25
Unbleachable	5.25 to 5.50
New White Canvas	11.50 to 12.00
New Mixed Blacks	5.25 to 5.50
Canton Flannels, Bleached	10.75 to 11.00
Shirt Cuttings—	
New White No. 1	10.50 to 11.00
White Shrunk	10.00 to 10.25
Silesias No. 1	8.50 to 8.75
New Unbleached	10.50 to 11.00
Fancy	5.75 to 6.00
Linen Cuttings—	
American	8.00 to 8.50
White	14.00 to 15.00
Grey	13.50 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.15 to 1.20
No. 2	1.05 to 1.10
No. 3 and No. 4	.85 to .95
Twos and Blues—	
Repacked	3.00 to 3.25
Thirds and Blues—	
Repacked	2.75 to 3.00
Miscellaneous	2.25 to 2.50
Whites, No. 1—	
Repacked	4.75 to 5.00
Miscellaneous	3.50 to 3.75
White, No. 2—	
Repacked	3.50 to 3.75
Miscellaneous	2.75 to 3.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	8.00 to 8.50
Wool Tares—	
Light	8.00 to 8.50
Heavy	8.50 to 9.00
No. 1 Scrap Bagging	6.00 to 6.50
Manila Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	4.50 to 4.75
Sisal Rope—	
No. 1 large	5.00 to 5.25
No. 1 small	4.50 to 4.75
New Burlap Cuttings	7.50 to 8.00
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	4.50 to 4.75
No. 2 sisal	4.00 to 4.25
Soft jute	4.25 to 4.50
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts.	95.00 to 100.00
Hard White, No. 1	75.00 to 80.00
Soft White No. 1	70.00 to 75.00
Soft White, one-cut	85.00 to 90.00
Soft White, Misc.	55.00 to 60.00
Fly Leaf, No. 1	30.00 to 35.00
Fly Leaf, Woody, No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines	18.00 to 19.00
Mixed Books	13.00 to 14.00
Ledger Stock—	
No. 1 White	40.00 to 45.00
No. 1 Mixed (Colored)	30.00 to 35.00
Manilas—	
New Env. Cuttings	60.00 to 65.00
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Manila Tab Cards	35.00 to 40.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	30.00 to 35.00
New 100% Cor. Cuts	30.00 to 35.00
No. 1 Old Assorted	25.00 to 27.50
News—	
White Blank	55.00 to 60.00
Overissue	14.00 to 15.00
No. 1 Baled	8.00 to 9.00
Old Corrugated Containers	9.00 to 10.00
New Jute Corrugated Cuts	18.00 to 19.00
Mill Wrappers	6.00 to 7.00
Box Board Chips	5.00 to 6.00
No. 1 Mixed Paper	5.00 to 6.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.05—
Ground, cwt.	3.80—
Powdered, cwt.	4.20—
Blanc Fixe—	
Pulp, bulk, ton	77.50—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	4.25 to 4.50
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	20.00 to 20.50
Argentine, lb.	19.00 to 19.50
China Clay—	
Domestic Filler	
Bulk (mine) ton	10.00 to 15.00
Domestic Coating	
Bulk (mine) ton	15.00 to 25.00
Imported (ship side)	
Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.40 to 2.70
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	.24½ to .25
Litharge, powd., bbl. lb.	.14 to .14½
Rosin (Gum)—	
New York, per 100 lbs.	
E	7.45—
F	7.45—
G	7.45—
WWX	7.65—
Rosin (Wood), carlots	5.70—

MARKET QUOTATIONS

Salt Cake—	
Dom. bulk (wks) ton	26.00 to 28.00
Imp. bulks on dock—(Atl. ports) ton (Nom.)	27.00 to —
Soda Ash—	
Bulk (works), cwt.	1.10 to 1.20
Paper Bags, cwt.	1.30 to 1.40
Barrels, cwt.	1.70 to 1.80
Soda (Caustic)—	
Solid drums, cwt.	3.05 to 3.10
Ground and flake, drums, cwt.	3.45 to 3.50
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg. 35 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	4.82—
Pearl, barrels, cwt.	4.82—
Paper, (Sp.) bags, cwt.	4.83—
Powdered, barrels, cwt.	4.93—
Sulphur (Crude)	
(Mine) bulk, long ton	16.00 to 18.00
Talc—	
Dom. 100 lb. bags (mine) ton	22.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	.19½ to—
Calcium Pig, bbls., lb.	.19½ to—
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

Bleached sulphite, Swed.	118.00 to 122.00
Bleached sulphite, Finish	118.00—
Bleached sulphite, dom.	118.00—
Easy bleaching sulphite	—
Unbleached kraft, Finn	94.00—
Unbleached sulphite, Swed.	100.00 to 105.00
Unbleached sulphite, Fin.	115.00—
Unbleached sulphite, dom.	100.00—
Unbleached kraft, Swedish	94.00 to 97.00
Unbleached kraft, northern	94.00 to 105.00
Unbleached kraft, southern	80.00—
Bleached sulphate, Swedish	126.00 to 128.00
Bleached soda, domestic	113.00—
Sulphite screenings, dom.	40.00 to 50.00
Sulphate screenings, dom.	40.00 to 50.00
Groundwood, domestic and Canadian	60.00 to 65.00

PAPER

f.o.b. New York City

	per ton
Boards—	
Binders	94.00—
Chip	70.00—
Chip, tube and can	75.00—
Chip, full blending	77.50—
Chip, sgl. mls. lined	77.50—
Coated, white patent .016	115.00—
.020 and heavier	105.00—
Kraft liner	95.00 to 105.00
Filled News	72.50—
Container	85.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	14.40—
B Grade E.F.	14.40—
A Grade S. C.	15.90—
B Grade S. C.	14.80—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	20.15—
No. 2 Glossy	18.90—
No. 3 Glossy	18.15—
No. 4 Glossy	—
No. 2 Offset	14.60—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond— (In Ton Lots)	per cwt.
Extra 100% Rag	51.40—
100% Rag	44.55—
75% Rag	33.10—
50% Rag	28.10—
25% Rag	24.85—

Rag Content Ledger— (In Ton Lots)	per cwt.
Extra 100% Rag	52.65—
100% Rag	45.65—
75% Rag	35.15—
50% Rag	29.40—
25% Rag	26.15—

Sulphite Bond—	per cwt.
Air dry, watermarked	—
No. 1 watermarked	17.50—
No. 2 watermarked	16.75—
No. 4 watermarked	15.50—

Sulphite Ledger—	per cwt. Zone
No. 1 watermarked	18.80—
No. 2 watermarked	18.25—
No. 4 watermarked	17.75—

Glassine (f.o.b. mill)—	per cwt.
Embossed (25 lb. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—	per ton
Rolls, Standard Contract)	100.00 to 103.00
Rolls (Spot)	(Nominal)
Sheets	119.00—

Tissues (Carlots)—	per ream
White No. 1	1.60—
White No. 2	1.20—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.45—
Manila	1.60—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M. shts.) per cs.	8.75 to 10.00
Toilet, Unbleached (M. shts.) per cs.	7.50 to 10.00

Towels—	per case
Bleached	4.75—
Unbleached	4.00—

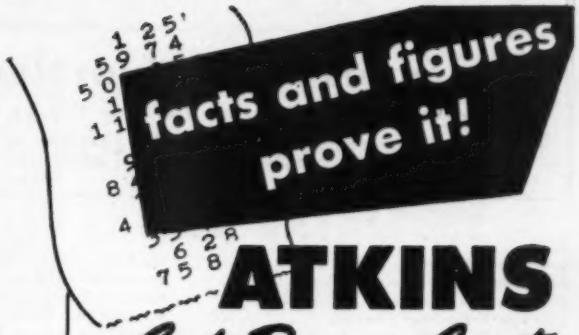
Wrappings (Kraft)—	per cwt.
Super-Standard	8.50—
No. 1 Wrapping	7.00 to 7.50
Standard Wrapping	6.75 to 7.00
Standard Bag	6.00 to 6.50
Variety Bag	—

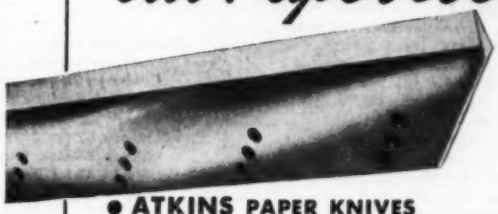
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)	per cwt.
Bleached Papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only)	—
(10,000 lb.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Envp. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrim'd ream marked, in bdls.)	—

Wrapp Mla. 35 lb. up—	
No. 1	—
No. 2	—

M.G. Sulphite and Kraft (other than Waxing)	
Grade B20 lb.	—
Grade A-22 lb.	—





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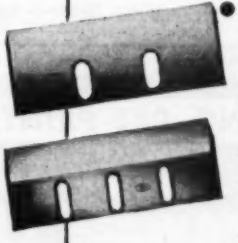
When records show Atkins Paper Knives serving two to three times as long between grindings as ordinary knives—that means real savings that you should be realizing. Made of special analysis steel, specially heat-treated—then ground, honed and polished to eliminate all trace of "drag"—Atkins not only stay in the cutter longer, but deliver consistently cleaner, smoother cuts throughout this *extra* cutting period.



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Here's what one user says: "Atkins Knives grind faster and easier and hold their edge longer than any other knives we have used. We have less breakage and less chipping." Specifying Atkins can help you to cut your pulp costs by producing uniform, unbruised chips with minimum knife expense.

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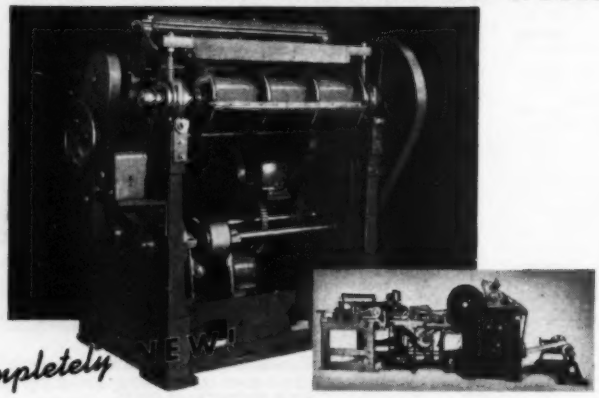

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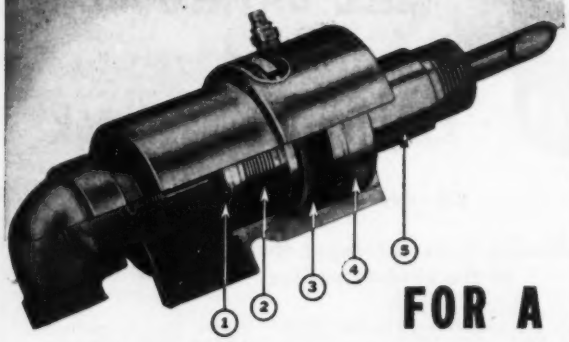

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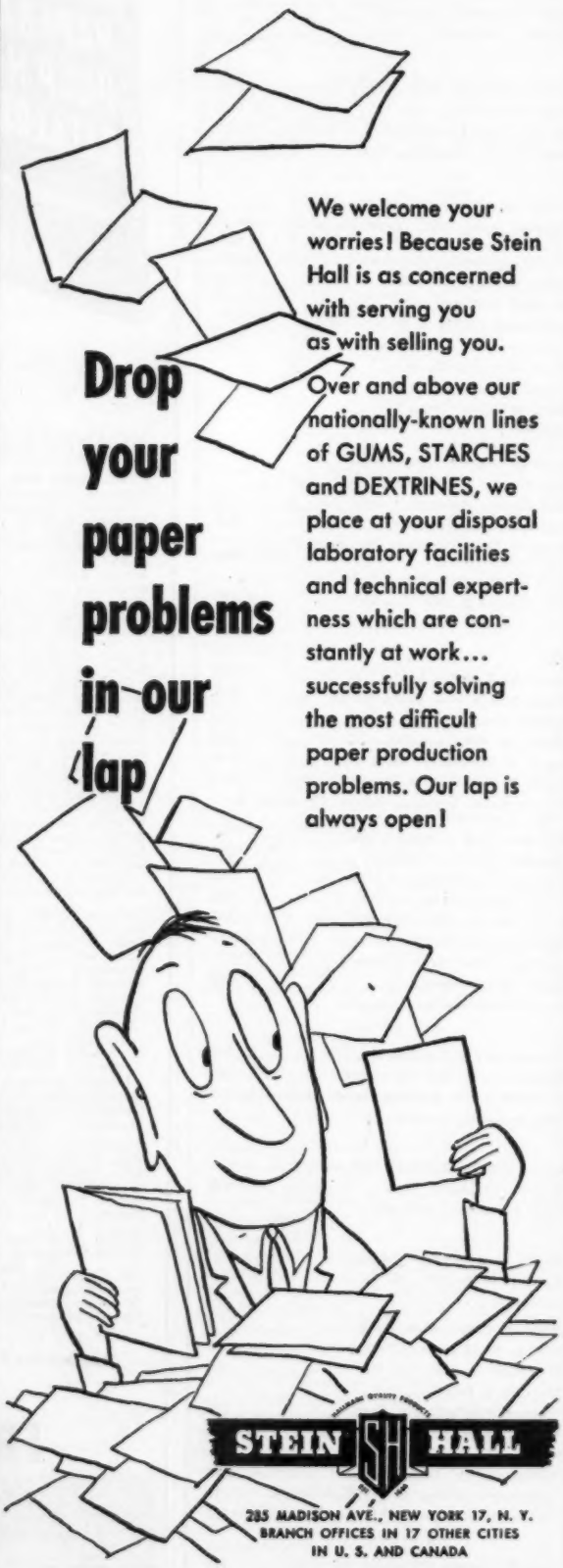
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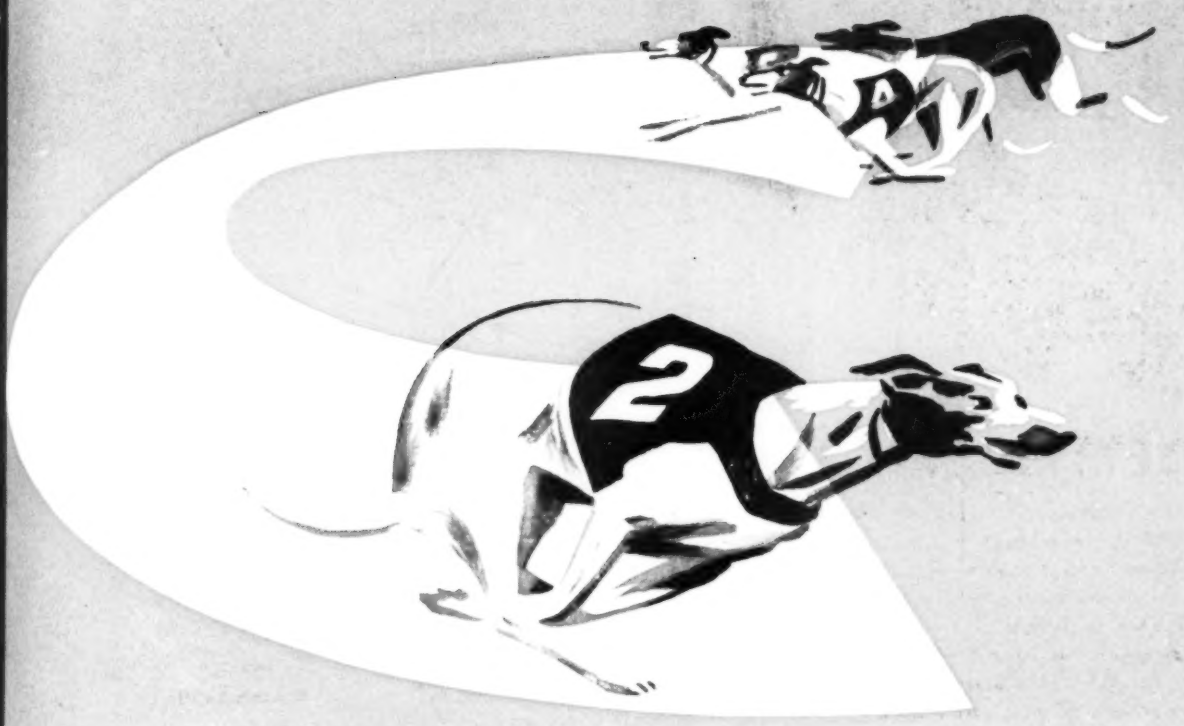

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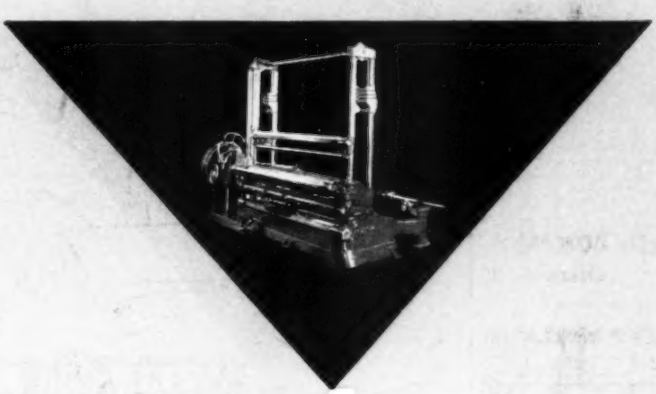

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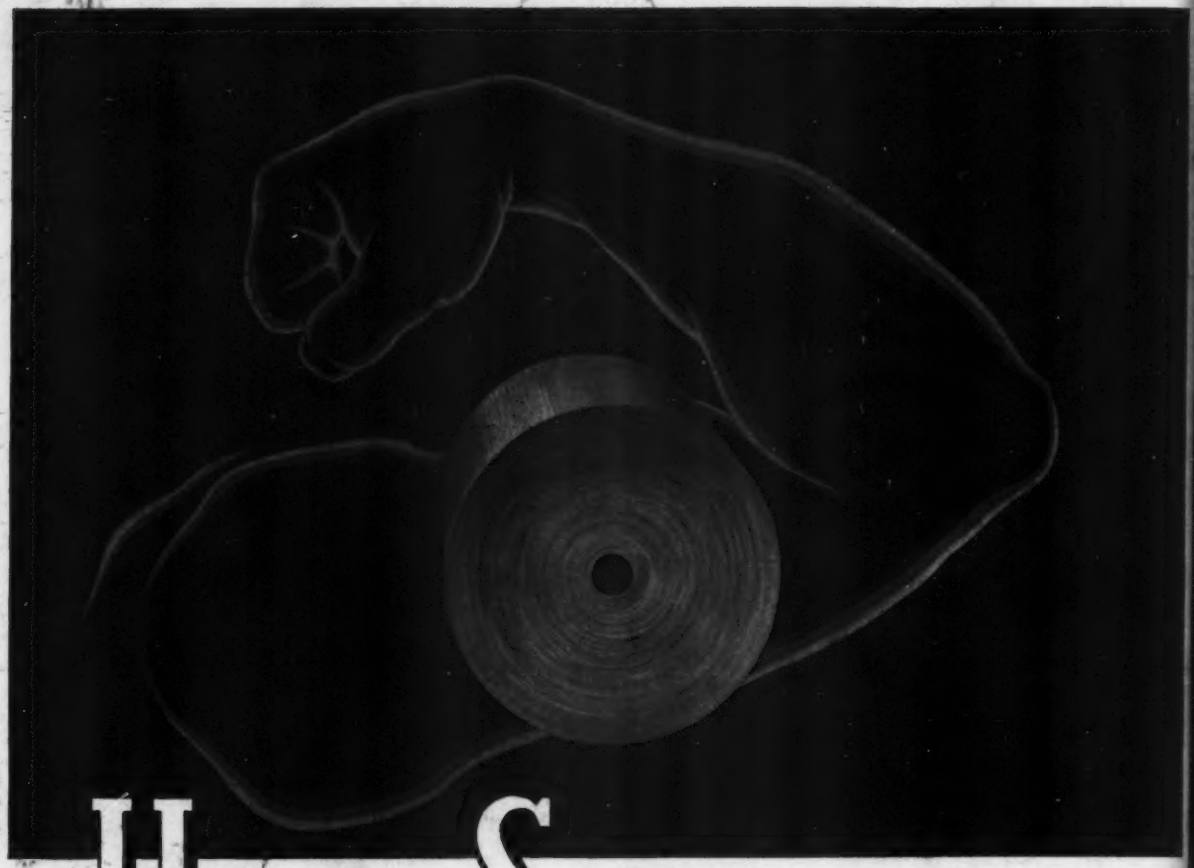

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